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# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association  
Northern Minnesota Medical Association and Minneapolis Surgical Society*

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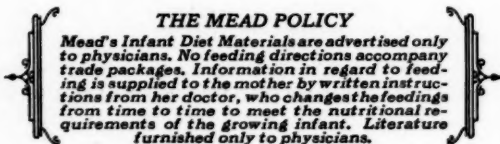
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# MINNESOTA MEDICINE

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Vol. XI

FEBRUARY, 1928

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## FRACTURES ABOUT THE ANKLE JOINT INVOLVING THE TIBIA AND FIBULA\*

JAMES MORLEY HITZROT, M.D.

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**F**RACTURES of the tibia and fibula which involve the ankle joint are as yet somewhat unsettled in the mind of the ordinary surgeon because they have been confused by the terms Pott's fracture, Dupuytren's fracture and other names applied to fractures in this region which are not sufficiently inclusive and which do not describe or include the great variety of lesions found in clinical experience, especially since the x-ray has added to our knowledge of the types of bone injury.

Ashhurst very aptly states that "Pott described a fracture that does not exist." Maisonneuve, Tillaux, Honigschmied, and Stimson studied lesions by experiments upon the cadaver, arriving at conclusions which were at variance with one another. Ashhurst puts the matter very concisely when he says that "the study of the mechanism of these fractures by experiments upon the cadaver has many limitations, as it is impossible, in the cadaver, to reproduce the mechanism which occurs in the living patient."

Cooper classified the fractures in this region as dislocations of the tibia on the ankle and considered the fractures as incidental to the dislocation rather than the cause of it.

Maisonneuve drew attention to the importance of the inferior tibio-fibular ligaments in fracture about the ankle and drew attention to the common mechanism, namely, external rotation which produces one of most frequent lesions, namely, the mixed oblique fracture of the fibula.

Destot studied the lesions by means of the x-ray and was the first writer to classify the fractures from a study of the bone lesion by the x-ray.

Destot made a classification based upon the function of the component bones: (1) fractures of the tibial plateau, which affect the supporting mechanism and disturb weight bearing; and (2) fractures of the malleoli, which distort the ankle mortise and interfere with the equilibrium of the foot.

Ashhurst's comprehensive contribution reviews the communication of the previous writers on this subject and offers a classification of the fractures which is based upon a definite anatomical and mechanical basis (*vide infra*).

**Etiology.**—Fractures of the tibia and fibula involving the ankle joint are produced by indirect violence in the vast majority of cases. Fractures by external rotation of the foot occur in 61 per cent, by abduction of the foot in 21 per cent, by adduction in 13.3 per cent, by compression in the long axis of the leg in 2.7 per cent, while only 1.7 per cent are the result of direct violence.

**Mechanism.**—The mechanism which produces a fracture involving the tibio-fibular mortise is the result of abnormal movements at the ankle joint, that is, movements in external rotation, abduction and adduction, while a small number are the result of exaggerated movements in the normal range of flexion and extension, or as a result of compression in the long axis of the bone, or by direct crushing accidents. In the living, the mechanism producing a fracture at the ankle is rarely a single force, but is more often the summation of a variety of forces which may act singly at different times or may all act together at the same time. For example, in an accident the foot may be abducted and then rotated externally, or both may occur simultaneously. This variance in the time and

\*Read before the Great Northern Railway Surgeons Association June 24, 1927.

variety of the component forces, together with the variations in the degree of the violence exerted, produces a distinct difference in the character of the bone lesions which result from the same mechanism and a variation in the amount and direction of the displacements.

The normal movements of the ankle joint are those of flexion (dorsiflexion) of 20 degrees and extension (plantar flexion) of 60 degrees. Normal motion in abduction and adduction in the foot occurs beneath the astragalus between the astragalus and the calcaneum. Movements of inward rotation of the foot occur with adduction, the movement taking place in the anterior tarsal joints (Maisonneuve).

External rotation of the foot is resisted by the tibio-fibular mortise, the foot being converted into a rigid lever (Maisonneuve), and the strain becomes greatest upon the external malleolus from two forces: a push out and against the anterior border by the astragalus and a pull inward on the posterior border by the strong posterior band of the external lateral ligament (Honigschmied), producing a fracture by torsion. The line of this fracture runs obliquely from above and behind downward and forward, involves the inferior tibio-fibular joint and extends low down on the fibula, sometimes to its tip (Ashhurst). There is little or no displacement and no separation of the tibio-fibular mortise. If this external rotation continues after the fibula breaks, either the internal lateral ligament tears or the tip of the internal malleolus pulls off. The displacement in this variety may be slight or marked.

The posterior margin of the tibia is broken very frequently—in addition to the above two bone lesions—by crushing force from below upward (Ashhurst) with the foot in plantar flexion (Lucas Championniere).

Abduction of the foot occurs in the astragalocalcanean joints. Movements in abduction beyond the normal are resisted by the strong ligaments which bind these bones together and the force is transmitted through the astragalus to the tibio-fibular mortise. In forced movements beyond the normal, the greatest strain comes on the internal lateral ligament, which fractures the internal malleolus or the ligament tears (Bonnet). If the abduction continues, a crushing fracture of the external malleolus below the inferior tibio-fibular joint occurs. The inferior

tibio-fibular ligaments influence the resulting lesions when forced abduction of the foot occurs. If they hold, the external malleolus breaks below the tibio-fibular joint (rare). If they tear, the fibula breaks above the tibio-fibular ligaments through the narrow part of the fibula and diastasis of the tibio-fibular mortise occurs and the foot drops out and back (the ordinary type described as Pott's fracture or the Dupuytren fracture of the French).

If external rotation of the foot occurs with abduction, the fracture of the fibula is of the oblique type described above and the inferior tibio-fibular ligaments are as a rule untorn. If they tear, the fracture which occurs is a fracture high up in the fibula (the so-called Maisonneuve fracture).

The attachment of the inferior tibio-fibular ligaments to the tibia may be torn off instead of the ligaments tearing, producing the intermediate fracture of Tillaux first described by Cooper. In this group of abduction fractures Ashhurst also places those fractures through the whole lower surface of the tibia with a bending fracture of the fibula similar to that described above when the tibio-fibular ligaments tear.

In fractures from adduction the sole of the foot is inverted and the entire foot adducted beyond the normal range of motion possible in the tarsal joints. The strain is thrown on the external lateral ligament, which tears or pulls off the tip of the external malleolus, or the malleolus breaks transversely. These may be accompanied by a compression fracture of the internal malleolus or the after-coming weight of the body may split the tibia upward by forcing it against the astragalus.

Tillaux produced a supramalleolar fracture of the tibia through its lower third with a fracture of the fibula below the tibio-fibular ligament by adduction.

The displacements to be noted are those which cause a disturbance of the weight-bearing axis of the ankle joint with disturbance of the tibio-fibular mortise and a disturbance in the position of the astragalus in its relation to the tibio-fibular mortise.

*Classification.*—No satisfactory classification of the fractures about the ankle joint exists. In fact the varieties of the lesion are so numerous that it is difficult to place certain fractures in any definite category. Ashhurst believes that an im-



perfect classification based upon the mechanism which produces the fracture is essentially easier to understand and remember than the more elaborate classification of Tanton. Certainly it is necessary to understand the mechanism which brought about the fracture to properly correct the existent displacements and to bring the foot into the proper weight-bearing axis with the tibia.

#### ASHHURST'S CLASSIFICATION

##### A. Fractures by External Rotation:

1. First degree: Lower end of fibula only (mixed oblique).
2. Second degree: Same, plus rupture of internal lateral ligament or fracture of the internal malleolus (low Dupuytren), viz.,
  - (a) Internal lateral ligament uncomplicated.  
Internal lateral ligament complicated by posterior marginal fragment of tibia.
  - (b) Internal malleolus, uncomplicated.  
Internal malleolus complicated by posterior marginal fragment of tibia.
3. Third degree: Same, plus fracture of whole lower end of tibia, representing the internal malleolus.

##### B. Fractures by Abduction (Fibular Flexion):

1. First degree: Internal malleolus only.
2. Second degree: Same, plus fracture of fibula (transverse above or below tibio-fibular joint).
  - (a) Below inferior tibio-fibular joint (no diastasis) (bimalleolar fracture).
  - (b) Above inferior tibio-fibular joint (with diastasis) (Pott's fracture, Dupuytren type).
3. Third degree: Internal malleolus represented by whole lower end of tibia.

##### C. Fractures by Adduction (Tibial Flexion).

1. First degree: External malleolus only, transverse at or below level of tibial plafond.
2. Second degree: Same, plus—
  - (a) Internal malleolus below level of tibial plafond (bimalleolar fracture).
  - (b) Median surface of tibia up and in from joint surface.
3. Third degree: Same, plus whole lower end of tibia (supramalleolar fracture by adduction).

##### D. Fractures by Compression in Long Axis of Leg:

1. Isolated marginal fractures.
2. Comminution of tibial plafond.
3. T or Y fractures (V fractures of Goselin).

##### E. Fractures by Direct Violence (Supramalleolar Types).

*Epiphyseal Separations.*—Epiphyseal separations while not common are not rare. The epiphysis of the fibula, of the tibia, or both, may be separated by the same mechanism which produces fractures in the adult. The elasticity of the joint in the young child permits forced movements much wider in range than in the adult, but disturbance at the epiphyseal lines occurs quite frequently and it is apt to be the cause of the so-called sprained ankle in the growing child. The treatment is essentially that of the adult, except that complete reduction, especially of the tibial epiphysis, is desirable. I have seen one case of early ossification of this epiphysis in a boy of fourteen with corresponding change in the length of the tibia and interference with the ankle joint. The fibula grew and a varus position of the foot interfered with walking.

*Symptoms.*—The symptoms of an ankle fracture depend upon the factors spoken of in the discussion above. Pain, disability, deformity, etc., vary extensively.

Clinically we may recognize:

1. The possible fractures, i.e., those in which the injury involves the region of the ligamentous attachments about the ankle mortise. It may be difficult to determine whether a fracture exists, since swelling, ecchymosis and localized tenderness are as marked in the ligamentous injuries as in the fractures with no displacement. Careful examination of the bone will usually reveal an area of linear tenderness over one or the other of the malleoli.

2. The undoubted fractures with lateral mobility in the ankle joint, shifting of the foot into the valgus or varus position, displacements of the foot posteriorly or otherwise which indicate the varying types of fractures.

*X-Ray.*—The recognition of all the lesions existent in the given case must be made by a proper x-ray examination, but careful physical examination should reveal the principal bone lesion. If possible, an x-ray examination is desirable. If too much delay must occur before the x-ray can

be taken, I prefer to proceed without it, as the earlier any displacement is corrected the less the reaction and I prefer to reduce these fractures within the first two hours after the injury.

After the reduction an *x*-ray is essential to ascertain the character of that reduction. If the weight-bearing axis and relation of the ankle mortise are not satisfactory, the manipulation, under an anesthetic preferably, should be repeated. Gas and oxygen may suffice for first reductions but secondary manipulations should be done with complete relaxation under ether, and ether should be used in either case if satisfactory relaxation is not possible otherwise.

**Treatment.**—The aim of all treatment of ankle fractures should be to restore the normal weight-bearing axis between the tibial plateau and the astragalus and to restore the normal relation of the astragalus and the tibio-fibular mortise.

1. The common fracture, that is, the fracture by external rotation, with little or no displacement of the foot, requires a support with the foot straight (horizontal) and the sole slightly inverted. Two moulded plaster splints, one posterior and one interolateral, serve admirably and may be applied immediately and the foot elevated and an ice bag placed over the ankle joint for twelve to eighteen hours. Massage should be begun early (first to third day), and active motion and baking with dry heat at the end of the first week. The plaster splints should be worn from two to four weeks and weight bearing prohibited for two weeks after removal of the splint. In extreme cases a short caliper splint with a foot plate may be required when weight bearing is begun and the patient advised to avoid external rotation, that is, cautioned to walk with the toes turned in, "pigeon-toed" if you will.

2. In the cases by rotation with the varying degrees of displacement above described the displacement should be corrected by manipulation under an anesthetic and the normal weight-bearing axis and the normal relations of the ankle mortise restored. Care should be taken to correct all posterior displacements. Once the displacements have been corrected the leg should be splinted from above the knee to the toes in two moulded plaster splints with the foot in slight dorsiflexion, adducted, the sole inverted, the foot elevated and an ice bag used as above.

The after-treatment, such as massage, motion, etc., should be begun as early as the individual

case will permit without the danger of producing displacement, which is usually possible about the end of the first week. The plaster splint should be worn for from four to six weeks and weight bearing prohibited for two weeks longer. A caliper splint with a foot plate, or a high shoe with a Thomas heel and the inner edge of the sole raised for one-quarter to three-eighths of an inch (especially the latter), is advisable for a number of months after the removal of the splint.

In the cases in which abduction has entered, the same remarks apply as those in the second paragraph above, with this exception, that the foot should be drawn forward, strongly *adducted* and the sole *inverted* as far as possible.

In the cases by adduction, especially when the internal malleolus is broken, adduction of the foot is to be avoided in the reduction. Displacements should be corrected under an anesthetic if necessary and the foot placed in the straight position in slight abduction, *i.e.*, abduction sufficient to restore the tibio-fibular mortise, and the leg put up in moulded plaster splints, posterior and externolateral, for from four to six weeks. Massage and motion should be begun in from three to seven days, depending upon the injury, with baking, etc. Weight bearing should be delayed for two weeks after removal of the splints and in the severe injuries a short caliper splint and foot plate are advisable.

In all cases the patients may be allowed up on crutches as soon as the inflammatory reaction has subsided, usually the third to the tenth day. Swelling in the foot can be met by elevation of the leg during the resting intervals and rarely requires elevation in the recumbent position. That swelling will occur if up and about should be explained to the patient and the patient advised to sit and to lie with the leg above the level of the hips in a comfortable position when not walking about.

**Prognosis.**—The prognosis varies according to the character of the injury, the age of the patient and the restoration of the ankle mortise. Severe injuries with marked dorsal displacements will have some limitation in motion, especially in dorsal flexion at the ankle, and in individuals over thirty-five some pain after use occurs in about 25 per cent of the cases, which becomes more marked as the age incidence increases.

Uncorrected or partially corrected cases with valgus deformities suffer from numerous disabilities such as flat foot, pain in the foot and leg on walking, pain in the knee and hip.

Cases with varus deformities suffer chiefly from ankle disabilities.

In general, the more nearly normal the ankle restoration, the earlier the reduction, and the more carefully the after-treatment applicable to the given case is carried out, the better the prognosis.

In rare cases, especially in women with arthritic symptoms, permanent pain and swelling in the ankle joint and in the tarsal joints with pain on use will persist.

Cases with incipient tabes will suffer from marked disintegration of the tarsal bones with the corresponding deformity. (It is well to look for signs of tabes in all adults who receive fractures from slight injuries.)

*Treatment of Old Uncorrected Cases.*—Up to four weeks after injury, cases with valgus deformities may be corrected by manipulation with the Thomas wrench, first, by exaggeration of the deformity and then by rocking the foot back and forth until it can be carried into forced adduction with the foot in slight dorsiflexion.

Posterior displacements of the foot are more difficult to correct, especially if the tendo achillis is contracted. Tentotomy or tendon lengthening and manipulation with the wrench may reduce these cases.

In the cases seen later and in the above varieties in which the relation of the ankle mortise cannot be restored, correction by open operation is indicated. The operation is difficult and should not be resorted to in cases with mild disabilities which can be alleviated by a shoe with a raised sole and a Thomas heel or in individuals not essentially good surgical risks.

Supramalleolar osteotomy is a delusion as it cannot correct the posterior displacement.

The method most satisfactory is that advocated by Stimson, which reproduces the fracture, removes the new bone on the tibia and restores the joint axis. Two incisions are required. One incision exposes the fracture in the fibula by an incision from above the line of fracture curving downward and forward in front of the external malleolus. The fracture of the fibula is then reproduced by an osteotomy. The second incision is made on the tibial side and curves downward

and forward in front of the internal malleolus well forward onto the foot. The internal malleolus is freed and the ankle liberated and the tibial plateau projected into the wound and all new bone projecting into the mortise which will interfere with the correct adjustment removed. The tibia is then replaced and the ankle brought into correct position and the wounds closed without drainage and put up in a moulded plaster as for the recent injuries of a similar type. The after-treatment, especially as to massage, baking, etc., should be begun at about the end of the second week and the splint worn for six weeks. The short caliper and shoe as advised above are essential and I prefer to delay weight bearing until all signs of pain on graduated weight bearing with crutches has disappeared.

Stimson reports ten cases so treated with satisfactory results. I have done six cases, one with an excellent result, four with great improvement and one with little improvement in ankle joint motions but with the disappearance of pain after use.

In old cases of adduction fractures with a varus deformity the fracture should be exposed by two similar incisions and the displacement corrected after liberating the malleoli and the foot put up in slight abduction and treated as above, except that no raise to the inner edge of the shoe should be used.

Cases with equinus deformity should be treated by tenotomy (Robert Jones) or by lengthening the tendo achillis.

Dowd lengthened the tendo achillis in two cases with a large fragment split off the posterior surface of the tibia in which he failed to maintain reduction by the ordinary methods even with the knee flexed, and calls attention to the value of this method for the type to which it is applicable.

*Compound Fractures.*—Compound fractures at the ankle are mean injuries and are particularly prone to infection. Once infection occurs, drainage is difficult and the extension of the infection up the leg between the muscle planes and in the tendon sheaths makes amputation the only satisfactory cure. A properly fitted artificial leg is more satisfactory than the resultant disabled foot from this infection and exposes the patient to less risk.

A compound fracture of the tibia and fibula at the ankle should be treated as a surgical emer-

gency and operated upon at once. The tibia usually has projected from a tear on the inner aspect of the ankle. This wound should be excised, after the proper preparation, by sharp dissection. The fractured area should then be exposed by a long incision on the tibial side of the leg curving forward onto the foot and the tibia dislocated into the wound and its surface irrigated with hot saline solution. Hot saline irrigation of the joint should then be done and the blood clots expressed. A counter opening is then made behind the external malleolus and the tibia replaced and the fracture corrected. The operative wound is then closed by loose suture (without tension) about a rubber dam drain placed anterior to, but not into, the ankle joint, at the point most suitable for drainage. Through the counter opening on the fibular side a rubber dam drain is placed posterior to, but not into, the joint, and the foot put up in moulded plaster splints over an appropriate dressing. This may suffice and no infection occur. If infection occurs astragalectomy to provide free drainage is, in my experience, the easiest procedure. It should be done as soon as it is evident that the first procedure has not been sufficient. In badly soiled

cases, especially when infection seems inevitable, it is probably safer to do an astragalectomy at once and treat by the Carrel-Dakin method from the start.

After astragalectomy in either case as soon as possible, but only after the infection is controlled, the foot should be displaced backward and put in partial plantar flexion as advised by Whitman in astragalectomy in paralytic cases as this gives a better weight-bearing foot than if it is left otherwise.

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#### MONAHATO ANOTHER LEAD AND SULPHUR HAIR DYE

"Monahato" is put on the market by the Moulton Products Co., Lombard, Ill. It is described as the "original, natural hair tonic." Contrary to the claims on the package, Monahato is *not* a "natural hair tonic"; it is not "a genuine herb compound," and it *does* "rely upon harmful chemicals" for the property it has of dyeing the hair. Although the carton declares, by inference, that Monahato contains no lead salts or sulphur, analysis of the preparation in the A. M. A. Chemical Laboratory disclosed the fact that it contains both. In other words, Monahato is essentially a hair dye of the lead-salts and sulphur type. (Jour. A. M. R., December 10, 1927, p. 3059.)

#### MIRACLE PYORRHEA POWDER

"Let us save your teeth! We can do it! No matter how soft or how spongy and bleeding the gums may be, or the teeth so loose it seems you could pick them out with the fingers, the Miracle Pyorrhea Powder will make them hard and firm again." These were some of the claims made by the Miracle Remedy Co. of Detroit for its product "Miracle Pyorrhea Powder." Analysis seems to show that the preparation is essentially a mixture of baking soda and borax, or possibly boric acid, to which has been added a very small amount of aromatic oil. Some miracle! (Jour. A. M. A., December 10, 1927, p. 2059.)



## ACHYLIA AND THE EFFECTS OF HISTAMINE\*

C. B. WRIGHT, M.D.

*Minneapolis*

IN 1924, I studied 250 children between the ages of six and fourteen and found four cases of achylia. Two of these cases were examined a year later and in one of them there was no free hydrochloric acid and in the other only a slight amount. The other two were not re-examined.

Ryle and Bennet, studying a series of 100 medical students, found four with no free hydrochloric acid. It is probable that achylia is not common in the first two decades of life. On the other hand, Sidelin in Copenhagen found absence or greatly diminished secretion in 40 per cent of the working class above the age of fifty. Dedichen in Oslo examined ninety-nine healthy persons between the ages of sixty-seven and ninety-two and found anacidity in sixty-six and subacidity in seventeen. Series such as these would indicate that achylia becomes frequent toward middle life.

The method of examination might also have some bearing on its frequency. For example: Rehfus found by fractional analysis that a certain percentage of cases which showed no acid in a single sample taken 45 minutes to one hour would show free hydrochloric acid in varying amounts at other times during digestion. Hurst found this to be true in approximately 6 per cent of 662 cases.

Beard, Campbell and Hern, by the estimation of the total chloride, came to the conclusion that a small percentage of cases in which no acid could be found by the ordinary fractional meal showed a markedly increased amount of chloride. They attributed this rise in chloride to the neutralization of the hydrochloric acid by carbonates from the pancreas regurgitated through an abnormally patent pylorus. This would happen of course after gastroenterostomy. In a few cases, however, according to these observers, neutralization could only be explained by an excessive secretion of alkaline mucus from the antrum.

Lim, Mathieson and Schlapp found that 3 mgms. of ergamine phosphate would give a maximum secretion of free hydrochloric acid in about 20 minutes in the normal stomach. Doctors

Berglund, Wahlquist and Sherwood, working at the University Hospital, obtained acid values up to .5 per cent in the fasting stomach in normal patients. This is what Boldyreff and Carlson had found in the pure gastric secretion of dogs.

Eighteen cases of achylia were examined both by the injection of histamine and also the estimation of total chloride. These cases were seen in routine office practice. The method of procedure was as follows:

The patients were given a fractional meal in the morning and aspirated every 15 minutes through a Rehfus tube. These samples were tested for free hydrochloric acid by Gunzberg's reagent. This is important, as emphasized by McLain, because, if Topfer's reagent alone is used, one may get a weakly positive test for free hydrochloric acid which is caused by an excess of organic acids. After one hour the stomach was washed until we obtained a clear return, about 500 c.c. of water being used. Then 1.5 mgms. of ergamine phosphate was injected subcutaneously and the gastric secretion aspirated every 15 minutes for four aspirations. Tests for total acidity were made and the total chloride was estimated. The samples were also tested as before for free hydrochloric acid by Gunzberg's method, and if any acid was present it was quantitatively determined by Topfer's reagent, and also for total acidity and for total chloride by the method of Van Slyke.

Ergamine phosphate (Burroughs Wellcome Co.) very soon after its injection produced a profuse flushing of the skin and a slight injection of the conjunctiva. There is a profuse flow of saliva and a drop of both systolic and diastolic blood pressures of from 15 to 20 minutes. The maximum effect is noted in about 20 to 30 minutes, and it is at this time that the maximum secretion of free hydrochloric acid takes place if there is any response.

Eighteen cases were examined in all. None of these cases showed any free hydrochloric acid by fractional examination. In five of the cases, however, there was a definite secretion of acid following the injection of the histamine (Figs. 1 and 2). In the remaining 13 cases there was

\*Presented before the Minnesota Academy of Medicine, Jan. 11, 1928.

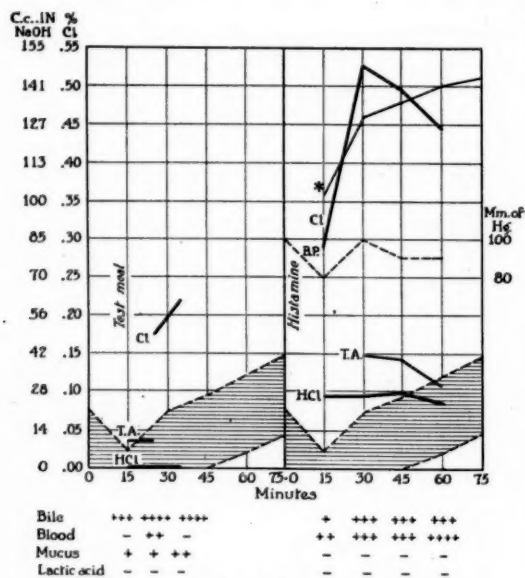
no free hydrochloric acid. In only two of the five cases showing free hydrochloric acid after histamine did the acid reach a normal limit. One of these was the case of gastroenterostomy with free hydrochloric acid of 27. The other was a case of secondary anemia in which the free hydrochloric acid was 28. The response in the other three cases was small in amount: from 9 to 14. The fact that one can get free hydrochloric acid in some achylia cases by the injection of histamine is of interest.

When we attempt to interpret the chloride curves in these cases, however, we are in trouble. The five cases in which we found free hydrochloric acid showed a uniform rise of chloride

the ordinary fractional meal and only partially neutralized after histamine, the neutralizing carbonates coming from the pancreatic secretion by regurgitation.

Regurgitation was definitely shown by the regurgitation of bile in varying degrees in all five cases. That the pancreatic juice may be regurgitated without bile, however, was shown by Wright and Medes. It is difficult to explain the wide difference between the hydrochloric acid and the chloride curves in these cases.

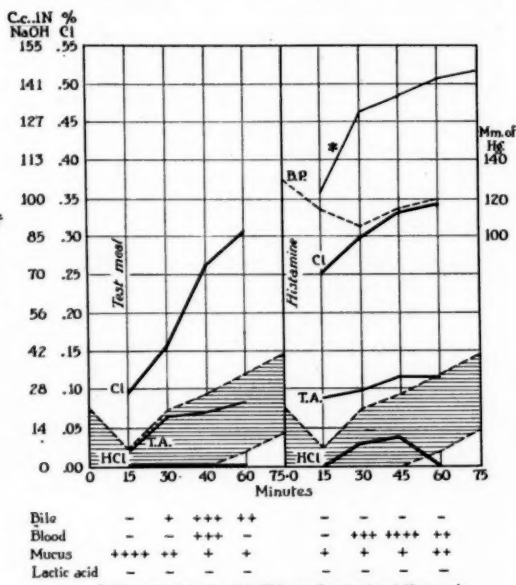
In the remaining thirteen cases showing no free hydrochloric acid either after the test meal or after histamine there were three cases of pernicious anemia. These thirteen cases divide



\* Total chlorides (as Cl); Walquist, Berglund and Sherwood  
Shaded area: Normal acidity; Bennett and Ryle

Fig. 1. G. M., age 34. Appendectomy, cholecystectomy, gastroenterostomy for ulcer. Stomach emptied in 2½ hours. No acid with fractional meal. Free hydrochloric of 27 after histamine; chloride .55 showing a high degree of neutralization.

after histamine. In the gastroenterostomy, the chloride curve went up to .55. This was a very large gastroenterostomy opening, the barium leaving the stomach in 2½ hours. The other four cases showed a chloride rise from .25 to .35. After the test meal there was more variability in the chloride curves, one showing a drop and later a rise, the other showing a rise. This group might be interpreted as a group in which varying amounts of acid are being secreted which are completely neutralized by regurgitation during



\* Total chlorides (as Cl); Walquist, Berglund and Sherwood  
Shaded area: Normal acidity; Bennett and Ryle

Fig. 2. G. F. H., age 33. Chronic tonsillitis, mucous colitis, gallbladder disease? No acid fractional meal. Free hydrochloric of 9 after histamine. Chloride curve up to .31 after fractional meal; .34 after histamine.

easily into two groups: (1) seven cases (Figs. 3 and 4), two of which showed a rise of chloride after the test meal; (2) five showed no rise. They all showed a rising curve of chloride after histamine, the chloride varying from .3 to .45. There were two early but clinically definite cases of pernicious anemia in this group.

We might explain some of these cases in the same way as before, a still smaller amount of acid being completely neutralized by regurgitation. Certainly not all of them could be ex-

plained in this way. The fact that there were two cases of pernicious anemia in the group would speak against acid being secreted according to the view generally held that there is no free hydrochloric acid secretion in pernicious anemia. We must assume, I believe, some other source for the chloride. These sources might be:

1. Regurgitated chloride from the duodenum. The highest chloride of the duodenal contents is reported by Hammerstin as about 0.2 per cent. This is too small an amount to be a factor, as are these cases which showed curves of from .25 to .4.
2. Blood and mucus we felt could not explain the rise because some cases showed a marked

proof that chloride is secreted as such in the stomach.

The second group of six cases (Figs. 5 and 6) showed no free hydrochloric acid and no rise in chloride after the test meal or after histamine. In three of these cases we could not get enough material to examine. We can be absolutely sure there was no acid secreted in this group. There was one case of pernicious anemia in this group of four years duration.

Dr. C. M. Watkins studied the blood of all these cases morphologically and he agreed with the clinical diagnosis in all but one of the pernicious anemia cases which had had liver before. Minot and Murphy have shown, confirmed by

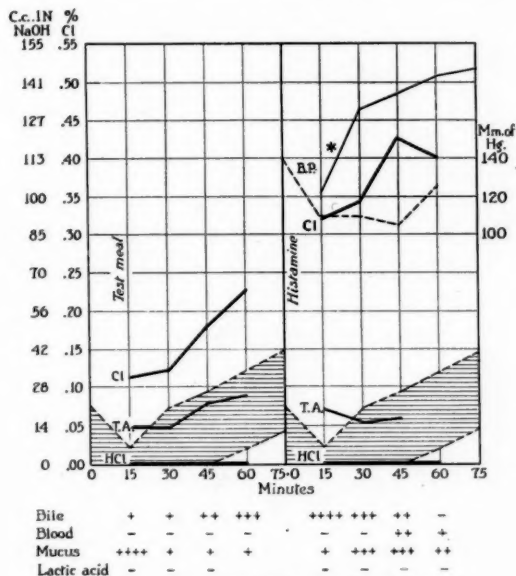


Fig. 3. A. P., age 35. Recurring mild appendicitis. Raynaud's disease mild (white fingers and toes). No acid fractional meal. No acid after histamine. Chloride up to .23 after fractional meal; .43 after histamine.

chloride with no blood and little mucus, and other cases showed no rise in chloride, although they had large amounts of blood and mucus.

3. There might be increased chloride from the test meal, as ordinary bread was used, or possibly from the saliva or blood. This might give a higher base line for chloride, but would not explain the rising curves.

4. Actual secretion of chloride would explain these curves but there is no experimental

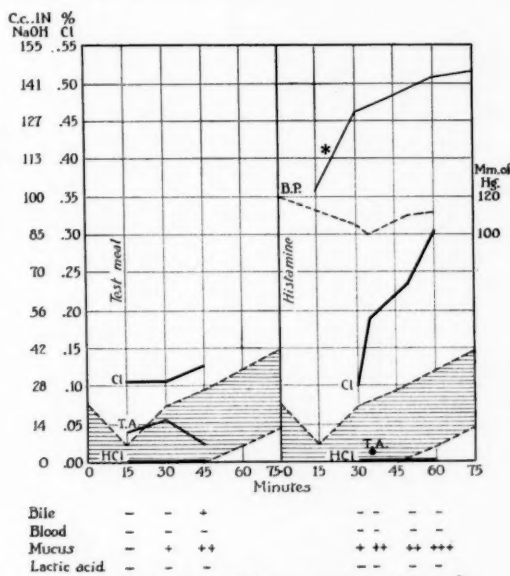


Fig. 4. Mrs. O. K., age 44. Mild secondary anemia, recurring attacks of chronic cholecystitis mild. No acid fractional meal or after histamine. No rise of chloride after test meal, but a marked rise up to .30 after histamine.

Watkins and others, that the blood loses its pernicious anemia characteristics after liver feeding.

We concluded from our results so far that the ordinary methods of examination are satisfactory as a rule. The procedure in clinical cases should be, first: An Ewald test meal unless achylia is suspected. If free hydrochloric acid is found this is sufficient. One of the great advantages of the Ewald test meal is that one can completely evacuate the stomach much quicker and more

completely. If no free hydrochloric acid is found, a fractional meal should be given, as about 6 per cent of the cases showing no free hydrochloric acid with an Ewald meal will show acid with a fractional meal.

If there is no acid by the fractional meal, then histamine might be tried, but I believe small doses should be used. Although we saw no serious untoward effects from the drug, two of our patients did show mild shock symptoms which quickly passed off on lying down. Hashimoto working at the Mayo Foundation under Doctor Willis showed that histamine will increase the non-protein and urea nitrogen in the blood and cause partial to complete heart block in dogs.

ordinary method of examination is not enough to greatly invalidate a large group, I reviewed a series of achylia cases. In a series of 3,000 patients seen in my office, 778 were given test meals. Of these 778, 116 had no free hydrochloric acid. (Only about one-fourth of these cases, however, were given a fractional meal.) This is 15 per cent, which is about the average reported in unselected series by Faber and Hurst. This series is unselected except that practically all of them had some gastrointestinal complaint. Of these 116 cases, 60 of them were females and 56 males. The age distribution was as follows:

No age given.....	3
10 to 20 .....	1

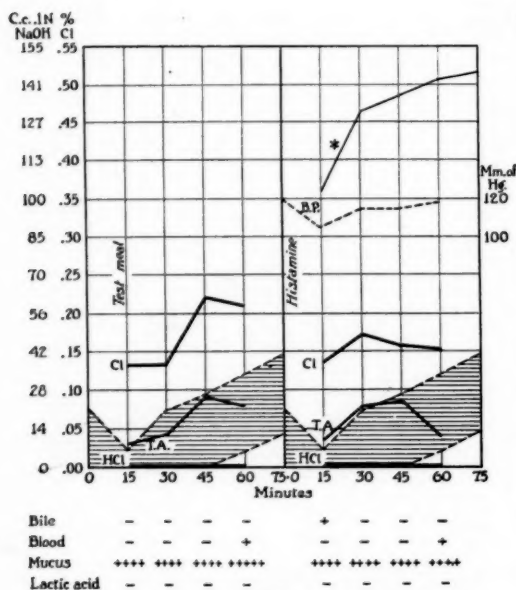


Fig. 5. P. A. Pernicious anemia of four years duration. Has had several transfusions. Hemoglobin 50 per cent. Red blood cells 1,904,000. No acid after fractional meal or after histamine. A slight rise of chloride after testmeal, but not higher than might be possible from regurgitation. No rise in chloride after histamine.

Very much larger doses, however, were used in his experiments. Inasmuch as Berglund, Wahlquist and Sherwood found that there was a maximum secretion in normal cases following doses varying from 1 mgm. to 3 mgm., I believe that .5 mgm. would be a much safer dose to use, and would give the same result with the exception that the secretion would not last so long.

Concluding that the percentage of error by the

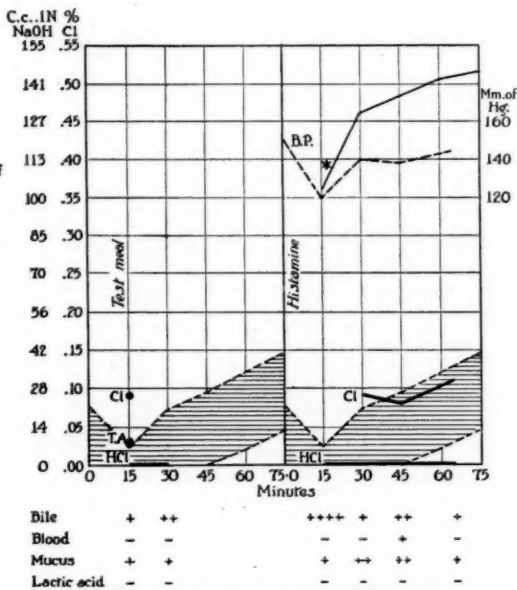


Fig. 6. Mrs. W. L. G., age 41. Hyperthyroidism. Basal metabolism plus 47. Mild cardiac decompensation. Fibroid uterus. No free hydrochloric after testmeal or after histamine. Only enough material for one determination after testmeal. No rise in chloride after histamine. Only small amounts of material could be obtained.

20 to 30 .....	11
30 to 40 .....	24
40 to 50 .....	28
50 to 60 .....	28
60 to 70 .....	18
70 to 80 .....	1
80 to 90 .....	1

Total—116



The age distribution of the whole series was as follows:

No age given .....	3
10 to 20 .....	16
20 to 30 .....	169
30 to 40 .....	239
40 to 50 .....	156
50 to 60 .....	120
60 to 70 .....	62
70 to 80 .....	12
80 to 90 .....	1

Total— 778

A comparison of these two groups in an attempt to find out what relationship there was between the age distribution of achylia and age distribution of the whole series of cases showed that the percentage of achylia cases reaches a maximum much later than the maximum of the total number of cases (Fig. 7).

It seemed of interest to analyze this series and determine as nearly as possible what was the trouble with these individuals. This of course is subject to the usual errors in clinical diagnosis. The clinical diagnoses were as follows:

Gallbladder disease .....	48
Chronic tonsillitis, pyorrhea, sinusitis.....	10
Chronic arthritis .....	10
Cancer of the stomach .....	9
Pernicious anemia .....	6
Chronic gastritis (alcohol or snuff).....	5
Cardiovascular (mild decompensation)....	4
Early tabes .....	3
Marked secondary anemia .....	2
Chronic pulmonary tuberculosis.....	2
Chronic salpingitis .....	2
Gastroenteritis (acute) .....	2
Appendicitis (subacute) .....	2
Gastroenterostomy .....	2
Acute catarrhal jaundice.....	2
Chronic cystitis and pyelitis.....	2
Hyperthyroidism .....	2
Esophageal spasm .....	1
Normals .....	2

Total— 116

In twenty-five cases the diagnosis of chronic tonsillitis, pyorrhea or sinusitis was made in addition to other pathology. Three cases had chronic arthritis in addition to chronic cholecystitis. Martius and Hurst would consider chronic achylia as largely due to a familial tendency.

Faber considers it due to gastritis. One might conclude from this series that achylia is largely a complication of chronic diseases which are most frequent after middle life.

If one excludes the cancer and pernicious anemia cases from this series, in 48 of the re-

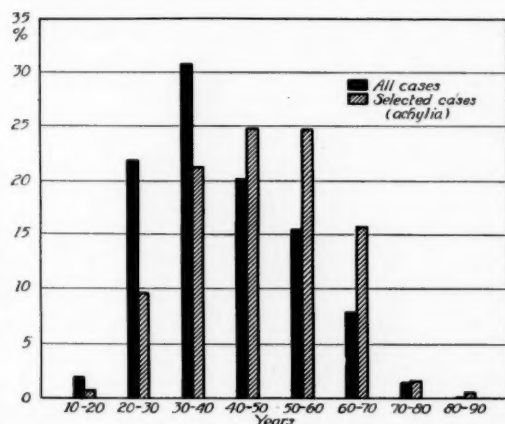


Fig. 7. Shows the percentage of achylia cases in 10-year periods, rising in a gradual curve and reaching a maximum much later than the maximum of the total number of cases.

maintaining 101 a definite clinical diagnosis of gallbladder disease could be made. Only the cases having definite attacks of pain or tenderness over the gallbladder region were included in the gallbladder group. In many of the remaining cases it could be justly suspected. Dye tests were not made on these cases. This agrees with the conclusion of Rovsing, that gallbladder disease is a common cause of gastric achylia and would indicate that the gallbladder should be suspected in all cases of chronic achylia with upper abdominal symptoms without obvious causes such as pernicious anemia, carcinoma of the stomach, chronic tuberculosis or general constitutional disease.

In twenty-five of these cases symptoms had been present for less than one year. In fifty-six they were present for one year or more; in twelve cases over 10 years. In the remaining cases a definite duration was not stated.

The average total acidity in the whole series was thirteen. The highest total acid was found in a case of cancer of the stomach with retention, namely 112. One sees in the literature that cases can be considered complete achylia which show no free hydrochloric acid and a total acidity of 10 or less. This would have excluded four cases of pernicious anemia out of six. One of

the pernicious anemia cases had a total acidity of 25.

The rapidity of emptying must be an important factor in determining the amount of organic acid. In many of the cases the fasting contents showed more total acid than after the meal. Twenty-eight of the 116 cases were examined twice or more times at varying intervals of time. In seven of these cases the absence of acid was not a constant finding. In three of the cases there was acid at the first examination, which later disappeared.

One case was that of a woman aged 66 first seen in January, 1918. The free hydrochloric acid at that time was 15 and the total acidity was 25. In 1919, the free hydrochloric acid was 11 and the total acidity 27. In 1927, there was no free hydrochloric acid and a total acidity of 13. I saw this woman first with an acute inflammation of the gallbladder. She has been quite well all these nine years, except for occasional attacks of indigestion. She has had no attacks of pain.

The second case was a man aged 42, seen October 1924. At that time he had free hydrochloric acid of 11 and a total acidity of 25. He showed no acid on two fractional meals or after the injection of histamine in 1927. This man, at the first examination, had a definite subacute cholecystitis with pain and tenderness. He has been well, since, except for some gas on his stomach at times which he says makes him careful of his diet.

The third case was a man aged 38, who had ulcer symptoms and had been treated for ulcer with relief before I saw him. His free hydrochloric was 60 and the total acid was 88. Exploratory laparotomy showed inoperable carcinoma of the stomach. Three months later the free hydrochloric acid was 0 and the total acid was 8.

There were four cases where the free hydrochloric acid came back after showing complete absence. One case, a man aged 43, when first seen was being actively treated for early tabes. He complained of loss of appetite and gas on his stomach. At that time the examination showed no free hydrochloric acid and a total acidity of 10. One month later after stopping treatment the free hydrochloric acid was 33 and the total acidity was 49. The second case was

one of acute catarrhal jaundice in a vigorous man of 30. During the height of his jaundice he had no free hydrochloric acid and a total acidity of 6. One month later, after the jaundice had cleared up, the free hydrochloric acid was 23 and the total acidity was 38. The third case was a man, aged 55, seen in 1925 with subacute gastritis following an acute upper respiratory infection. At that time he had no free hydrochloric acid and a total acidity of 12. The diagnosis of chronic gallbladder disease was also made at that time. Two years later the free hydrochloric acid was 26 and the total acidity was 44. This man has been well except for some indigestion and constipation which he has been told is due to a spastic colon. The fourth case was that of a man aged 39, who was a user of snuff and a periodic alcoholic. At first examination he showed no free hydrochloric acid and a total acidity of 14. Three years later the free hydrochloric was 16 and the total acidity was 30.

There were two pairs of husband and wife in this series. A family history of either achylia or pernicious anemia was not obtained in any of the cases in this series.

To summarize:

1. Eighteen cases of complete achylia by fractional test meal examination were given histamine and the free hydrochloric and the total chloride estimated. Five of these cases showed a definite amount of free hydrochloric acid after giving histamine. The remaining thirteen cases showed no free hydrochloric acid after histamine. In these cases there were three cases of pernicious anemia. The total chloride after the use of histamine showed a definite rise in all the five cases showing hydrochloric acid and in seven of the cases in which there was no free hydrochloric acid. The remaining six cases showed no rise in chloride.

2. A review of 116 cases of achylia found in 778 gastrointestinal examinations. In only two of these cases could nothing be found which might have had some bearing on the presence of the achylia. Gallbladder disease was the predominant diagnosis made in this series of cases. In three cases free hydrochloric acid was present at the first examination and later disappeared. In four cases it appeared after having been absent at a previous examination. There were two pairs of husband and wife in this

series. There was not a family history of achylia or pernicious anemia in any of these cases.

Conclusion: From this study, then, it might be concluded that achylia is seldom found in the first two decades of life; that its frequency rapidly increases toward middle life; that it may be temporary and associated with local inflammation of the gastric mucosa or with toxic conditions both chemical and bacterial; that it may be due to reflex causes from the gallbladder, appendix, pelvis or lungs; that some cases which have repeatedly shown no free hydrochloric acid by the usual fractional meal over several years show free hydrochloric acid when given histamine; that other cases of achylia show no response to histamine. In this study, all the cases of pernicious anemia were found in this group.

That some cases which give no free hydrochloric after histamine show no change in the chloride curves while others give a marked rise in chloride which cannot be explained at the present on any other basis than an actual chloride secretion from the stomach.

#### ANALGESIA IN CHILDBIRTH

The Council on Pharmacy and Chemistry has authorized publication of a report prepared by R. A. Hatcher on the Gwathmey Method of Anesthesia, concerning analgesia in childbirth. The available evidence indicates that the use of morphine during the first stage of labor and ether or chloroform for the second stage appears to be the accepted procedure and that morphine with chloroform appears to present special dangers. With proper precautions morphine sulphate in the dose of 0.01 Gm. (one-sixth grain) for a woman of average size, is virtually without danger. The report concludes that no method of inducing analgesia is suitable for universal use. So-called painless childbirth is frequently a most difficult problem. The general practitioner is often misled into believing that he can secure better results by the method that he reads about than by the methods with which he is familiar, when in truth it presents no essential advantage, and, on the contrary,

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it will prove inferior in his own hands to that with which he has acquired a certain degree of skill. In view of this, the commercial exploitation of proprietary products based on the Gwathmey formulas is potent for much harm, since it will inevitably tend to promote the thoughtless and ill-advised use of the method. (*Jour. A. M. A.*, December 31, 1927, p. 2258.)

#### RICINOLEATED SCARLET FEVER TOXIN

Unofficial reports indicate that the ricinoleated toxin has not protected effectively against scarlet fever in several institutions in which it was given. Theoretically it hardly seems possible that a single dose would establish a lasting immunity, and it is hardly to be expected that the addition of a "detoxifying" agent will increase the immunizing properties of a toxin. Ricinoleated toxin does not appear to be as reliable as the five doses of the Dick toxin. (*Jour. A. M. A.*, December 17, 1927, p. 2135.)

## ACUTE PANCREATITIS\*

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*Roseau, Minnesota*

**A**CUTE pancreatitis differs from acute inflammation of other organs in that it is essentially a process of self digestion. Some unknown element transforms the pancreatic zymogens into ferments within the gland structure itself.

The pathology of acute pancreatitis is not clear because of the fact that reconstruction of the picture from tissues partially digested is not possible, due to the loss of staining qualities. Therefore the solution of the etiology of acute pancreatitis must come from experimental evidence or data from the operating room.

We know there are only four possible avenues of entry for this element to the pancreas: the ducts, the blood and lymph streams and contiguous organs. Experimental evidence shows that injection into the ducts of bile, snake venom and many other substances can produce an acute pancreatitis. Section of the gland produces a local necrosis. Surgeons see many instances of acute pancreatitis with necrosis resulting from extension of infection along the lymphatics from the biliary tract. Ulcers of the posterior wall of the stomach have been associated with pancreatic necrosis. Thus it is barely possible that all these avenues of entry may be used.

It was my unfortunate experience some 15 years ago to produce an acute pancreatitis in an operative case. During an appendectomy for chronic appendicitis I felt of the gallbladder, found it distended and in order to determine the presence or absence of stones exerted some pressure upon it. There was a sudden release of tension as the gallbladder relaxed; no stones were felt in either the gallbladder or the ducts. No other evidence of disease was found. Within twenty-four hours it became imperative because of the alarming condition of my patient to reopen the abdomen. There was a beef-soup-like fluid in the peritoneal cavity; tallow-like spots were scattered through the omentum; the peritoneum looked as though it had been burned with pure carbolic. This was evidence enough

of the source of the trouble. A shallow rapid pulse, pain out of all proportion to the signs and persistent vomiting were a part of the picture. A large portion of the pancreas sloughed, but the patient finally recovered.

Needless to say, I have never squeezed another gallbladder to find out if there were stones in it. I learned definitely that a distended gallbladder spells disease, and that stones are of a minor consideration. I learned that bile forced out of the gallbladder may not always enter the bowel; that there was a sphincter of muscle fibres around the junction of the common and the pancreatic ducts and just below it; that closure of this sphincter may convert the common and pancreatic duct of Wirsung into one open channel. Is it not reasonable to believe that muscular contraction of the gallbladder might do exactly what I did with my hand?

In another case there was a history of the patient's having eaten about a dozen large, hot biscuits for supper. Pain developed within a few hours, increasing with such rapidity that he came for operation within 12 hours. The operative findings were the same as those in the previous case, with the addition of a gallbladder filled with very black bile. Can it be that this abuse of digestion produced a spasmodic contraction of the sphincter of Oddi and a powerful contraction of the gallbladder?

Why is it that dilute hydrochloric acid placed in the lumen of an isolated loop of duodenum having only its blood supply will stimulate pancreatic secretion? The nerve supply is cut off. Only stimulation through the blood stream is possible. What effect would a heroic stimulus via the blood stream have? Possibly a break in the synchronous action of nerve control of the sphincter and vascular control of the secretion may have some bearing upon this damming back of the pancreatic ducts. A study of the vascularity of the lobule shows glomeruli in relation to the Islands of Langerhans. This glomerulus differs from the glomerulus of the kidney in not having a single afferent vessel but in freely anastomosing with the vessels running between

\*Read before the Red River Valley Medical Society, Crookston, Minn., May 27, 1927.



the acini. Why is the blood supply to the glomerulus so abundant if it carries so little to the glomerulus and only the insulin away. Possibly the Islands have a dual role. I realize that this is purely speculative, but surely interesting.

Anyone doing surgery of the biliary tract has run into cases where there was marked infection of the gallbladder and areas of necrosis in the pancreas; so the relation of infection and its lymphatic transmission as a cause of acute pancreatitis is clear.

Opie has explained the relationship of stones lodged in the ampulla of Vater and bile backed into the duct of Wirsung.

The classical symptoms of acute pancreatitis are those of the fulminant type or acute hemorrhagic pancreatitis. This type is characterized by necrosis of large portions of the gland and extravasation of blood. In other types the necrosis is of a lesser amount and the symptoms of a corresponding degree in intensity.

The outstanding symptom is pain. In the hemorrhagic type it is agonizing, located usually in the epigastrium early, later to be referred anywhere along the course of filaments of the celiac plexus. Its relief requires heroic doses of morphia.

Tenderness early is rather general over the epigastrium but later is localized over the part of the pancreas involved. Palpation is usually rather difficult, owing to the depth of the gland from the surface.

Rigidity in my experience tells more than anything else, except the pulse. The depth of the gland from the parietal peritoneum lessens the boardlike rigidity usually associated with upper abdominal peritonitis. In the lower abdomen there is a sensation not unlike that experienced from blood in the peritoneal cavity—a feeling on examination resembling that of putting your hand into stiff bread dough.

Peristalsis in the lower abdomen ceases early and a reversal in the upper tract results in persistent vomiting. I have noted in two cases a typical stepladder distension of the bowel similar to that seen in ileus.

Thus we have a picture resembling both a perforation of a viscus and an obstruction.

One fears to appear dogmatic in differential diagnosis in cases of acute pancreatitis. However, I have found it of value where there was hesitancy in making a diagnosis as between per-

forative ulcer and obstruction to have an alibi ready in the shape of acute pancreatitis. This has been of infinite service to me and no doubt many of you doing the same type of work would find it of like value. Most diagnoses of acute pancreatitis are made either after the abdomen is opened or at necropsy. The depth of the lesion and its proximity to the celiac plexus make for a wide reference of the symptoms and the simulation of other acute abdominal disease. This obscurity and lack of definite localization should be significant.

Recently Moynihan laid stress upon the presence of surgical shock in acute pancreatitis and used it as a differential point. He pointed out that in perforation the pulse may be rapid but the volume does not change as it does in acute pancreatitis. I noted in a recent case, which, by the way, died before operation, a blood pressure reading of 95/80 and another later of 82/70. There was a definite palpable mass in the region of the pancreas on the seventh day with classical signs of pancreatic necrosis. The myocardium was so weak in this case that I did not dare risk even transportation and hoped for better results from operation later, as death was about all I anticipated with this pulse pressure as it was. I believe, however, that temporary surgical shock from the absorption of products of pancreatic digestion varies with the degree of necrosis.

Treatment of acute pancreatitis is surgical. Drainage is the key note. Drainage of the gland; drainage of the peritoneum; decompression and drainage of the biliary tract and drainage by dilution of the vascular system. Drainage of the gland limits the process of necrosis and also gives exit to the toxic products.

Access to the gland is obtained in three ways.

1. In cases where the stomach lies low, the approach may be made through the gastro-hepatic ligament. There is one disadvantage to this exposure in that neither head nor tail of the organ are exposed. It is, however, to be preferred in cases where there is a localized abscess pointed just above the stomach.

2. The gastro-colic ligament may be divided and the lesser peritoneal cavity reached directly. This gives the best drainage, the stomach being retracted up and the colon down, exposing the whole pancreas.

3. The mesentery of the transverse colon may be incised. The danger point in this ex-

posure is injury to the superior mesenteric and the middle colic artery, with resultant gangrene of the bowel.

After exposure of the gland, any areas showing discoloration from hemorrhage are punctured with a blunt forceps, sloughs are removed and drainage established. The skin should be protected from erosion by the trypsin of the pancreatic secretion.

The gallbladder is distended in pancreatitis. This means increased tension in the biliary tract. Decompression serves two purposes: drainage of infection and relief of tension. I have used drainage of the gallbladder and maintained it over considerable time. Others advocate removal of the gallbladder and drainage of the hepatic duct, but I cannot approve of radical surgery in a patient with such limited reserve power.

In a consideration of the treatment of shock in these cases I am convinced that the cause is deeper than damage done to the sympathetic ganglia. The cyanosis is thought to be due to a hemolysis. This disappears in a few days. Dilution of toxins should hasten its disappearance and be a great aid in ameliorating the shock.

Otherwise the treatment of shock does not differ from that in any other situation.

This report covers twelve operative cases and one non-operative. There were two deaths, one coming within twenty-four hours in a case operated upon and the other in the unoperated case. The time of operation seems to be the vital point in saving these patients. Necessarily, early diagnosis and the courage to explore even if the diagnosis is uncertain, gives opportunity for many more operations at an early hour.

To summarize:

1. Acute pancreatitis is a process of self digestion.
2. The cause of pancreatitis has not been definitely determined.
3. The symptoms point to both a peritoneal perforation and an intestinal obstruction.
4. The treatment should follow definite surgical principles.
5. Pancreatitis is not as rare a condition as we are led to believe by the text books.
6. If we were on the lookout for the conditions we would recognize more cases.

#### YOUTHRAY, ANOTHER LEAD AND SULPHUR HAIR DYE

"Youthray," which, according to the label, "restores your youthful natural color to gray hair" and is "not a dye," is put on the market by the Ray Laboratories, Chicago. A booklet declares that "Youthray is entirely harmless" and is "unusually effective for ending dandruff" and for "promoting scalp and hair health." The A. M. A. Chemical Laboratory analyzed the preparation and reports that it belongs to the lead acetate and sulphur type of hair dye. While cosmetics do not come under the control of any federal law, the claims regarding dandruff and "hair health" and similar claims should bring the preparation within the jurisdiction of the federal authorities. (Jour. A. M. A., December 17, 1927, p. 2133.)

#### POLIOMYELITIS ANTISTREPTOCOCCUS SERUM

In cases of epidemic poliomyelitis that come under treatment after the paralysis is well established, the best that can be done is to give as good general medical and nursing care as possible. Cases have been described in which convalescent serum—serum from patients who have recovered from the acute symptoms of the disease—appears to have prevented the development of paralysis. The use of Rosenow's poliomyelitis antistreptococcus serum can be justified only as an experiment. The claims of Eli Lilly & Co. to the contrary notwithstanding, this serum so far has not been accepted as of such value as to warrant its general use. (Jour. A. M. A., December 10, 1927, p. 2061.)

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## POSTOPERATIVE ILEUS\*

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THERE are few emergencies that a surgeon has to meet that are more discouraging than a case of postoperative ileus. In the first place the keen disappointment that he suffers at the failure of the first operation to relieve his patient, and then the necessity for subjecting his patient, in a highly critical condition, to a second operation more hazardous by far than the first, and the dismay and dread of the patient who has just passed through a difficult ordeal, produce a situation which requires real courage and prompt, decisive action on the part of the surgeon.

Postoperative ileus is encountered following many and various abdominal operations. It may rarely occur subsequent to extra-abdominal operations and conditions, as, for instance, in a case which came under my observation where a five months abortion of a decomposed fetus was followed on the ninth day by acute ileus. It may also follow injuries, as, for instance, in a man recently observed who, after a severe fall, developed acute ileus.

The great majority of cases, however, follow operations for acute appendicitis and pelvic conditions, and it has been the observation of many surgeons that most postoperative obstructions are found near the ileo-cecal valve and in the pelvis, perhaps due to the fact that a relatively large proportion of abdominal operations are in the lower abdomen.

High intestinal ileus, either paralytic or organic, is not uncommon after any abdominal operation but occurs perhaps more often following stomach operations, and is usually more toxic and more rapidly fatal.

The term ileus is used in this paper to mean both paralytic and obstructive, as the differential diagnosis between paralytic and obstructive postoperative ileus is not always possible previous to the institution of treatment, and the emergency of the situation precludes methods for accurate differential diagnosis with accompanying delay.

The clinical picture of a moribund postoperative case of ileus whether paralytic or obstructive

is essentially the same. The condition is that of a profound toxemia, with some of the added symptoms of shock. There is great prostration and evidence of dehydration. Usually there is vomiting; this vomiting is not projectile nor forceful, but rather a weak gulping up or slopping over of an over-filled stomach; the vomitus is a dark and foul regurgitation from stomach and duodenum. The abdomen may not be greatly distended, and there may not be much abdominal pain unless there is peritonitis present. The blood pressure drops and the pulse becomes rapid, weak and thready. The skin becomes moist and clammy; there are muscular twitchings and occasionally tetany. There is suppression of urine; and a drowsy semi-comatose state of mind gradually develops.

Many opinions have been advanced to account for the development of ileus so frequently after operation and its complete absence in cases where operative conditions seem to be similar.

Wilkie of Edinburgh has said recently that in a review of the post-mortem examination of a large series of so-called general peritonitis deaths occurring five to ten days after operation for acute appendicitis, intestinal obstruction accounted for 75 per cent of the cases, and that it has been proven that quite recent lymph-adhesions in these cases are sufficient to cause fatal intestinal obstruction.

Moynihan says that "postoperative obstruction coming shortly after operation is almost invariably due to infection, especially from pelvic peritonitis originating in appendicitis, or originating in septic conditions of the pelvic genital organs." He also emphasizes that a "limited peritonitis frequently causes a complete paralytic obstruction of the segments of intestine involved, which is so severe that unless dealt with promptly by surgery it will soon end fatally."

There is a type of obstruction brought on by rupture of an appendix lying over the brim of the pelvis or within the true pelvis, which in advanced cases is prone to cause localized peritonitis of a pelvic loop of ileum and also of the pelvic loop of the sigmoid.

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Sampson Handely many years ago emphasized these cases and showed how they could be rescued by anastomosing the ileum to the transverse colon and by cecostomy in order to side track the contents of both small bowel and colon from the obstructed sigmoid.

Long, of Greensborough, N. C., also has recently called attention to these cases and pointed out that enterostomy, which has become frequently a life-saving operation in acute obstructions, is not sufficient in these cases, but an anastomosis as above mentioned is essential. Fortunately, this type of obstruction is not very frequent.

On post-mortem examination of fatal cases of general peritonitis one sees the great tendency for the profuse lymph-adhesive exudate to bind coils of intestine together to form kinks. In these cases, actual organic obstruction follows.

On the other hand, where adhesions have not yet formed and where peritonitis is still localized in a single coil of intestine with injection of the superficial blood vessels and loss of normal luster, and the normal suppleness is giving way to a stiffening of the bowel, the paralytic type of ileus may result, and produce just as fatal an obstruction as the organic type.

Besides infection and peritonitis there are other causes of ileus which are not easily explained except on a basis of nerve disturbance. Rough handling, actual injury to the bowel, excessive manipulation, prolonged exposure to the air, as well as an irritating foreign body in the intestinal tract, may produce a paralytic form of ileus.

In this connection the theory of intestinal gradients as proposed by Alvarez is very interesting. Alvarez holds that peristalsis and reverse peristalsis are not produced and controlled by action of the nervous system on the involuntary muscle of the bowel but by inherent rhythmic gradients; in other words, the nervous system does not stimulate and control the involuntary muscle of the intestines to contract in peristalsis and in reverse peristalsis, but the involuntary muscles of the intestines have a systematic, orderly, inherent, rhythmic contraction, independent of the nervous system; that the gastro-intestinal tract is largely autonomous; that is, it carries within itself the mechanism necessary to peristalsis. Alvarez shows by numerous ani-

mal experiments that rhythmic peristaltic waves can be demonstrated in isolated segments of the bowel where all nerve control has been severed. The natural rhythmic peristaltic waves or gradients of the intestinal tract are onward, just as the ripples travel after throwing a pebble on the smooth surface of a sheet of water. The waves travel onward, one wave pushing the intestine ahead to form new waves.

Alvarez says that any injury to the bowel, infection, or foreign body, or disease causing irritation will stop the natural downward peristaltic waves and turn them backward in reverse peristalsis. Therefore acute infection of the appendix or tube or operation with operative injury or exposure of bowel to air, or rough handling or any irritation may sufficiently stop the natural downward peristalsis and start up reverse peristalsis and even produce an ileus.

Alvarez's gradient theory is not accepted by very many observers so far, but offers a very interesting explanation of reverse peristalsis as observed in so-called paralytic ileus.

Many interesting theories have been proposed of late years to explain the cause of death in patients with ileus. The formation of some highly toxic substance is held as the cause by most research workers, but the definite cause is yet unknown. Experimental studies have been attempted by many to clear up this problem and to find some rational method of overcoming it. A bacterial change, both proteolytic and putrefactive, has been advocated; also a primary proteose poison formed by the perverted activity of the mucosa. A shock complex following acute obstruction, rather than the formation of toxic substances, was advocated by Hausler and Foster as the deciding factor causing fatal issue; later they have held that the period of dehydration from failure of fluid intake, excessive fluid loss from vomiting, urinary, respiratory, and skin excretions in acute obstruction uncomplicated by tissue injury, corresponds to the time necessary to produce death by complete starvation of both food and water. Therefore they hold that death in uncomplicated cases of acute intestinal obstruction is due mainly to starvation.

Most observers agree that an alkalosis develops, perhaps due to the loss of chlorides and the liberation of sodium, and therefore the use of sodium bicarbonate in stomach washings, by the



bowel or into the blood, in these cases is contraindicated.

Careful blood chemistry studies have shown a loss of chlorides and a rise of carbon dioxide combining power of the blood plasma and the rise of non-protein nitrogen in the blood.

The loss of chlorides in the blood is so striking that it is pointed out by McVicar as of diagnostic significance when found early in a case suspected of ileus, and may be of much help in recognizing the serious condition just beginning. Even the urinary output of chlorides is diminished and may be of diagnostic help. There is also an actual diminution in the quantity of the urinary output.

The gradual drop in the blood pressure readings becomes more marked as the disease progresses and the toxic prostration becomes more marked, but repeated early readings will show a definite drop which is important if it continues.

#### TREATMENT

It is a frequent observation that after operation in a serious case of appendicitis, if a fecal fistula forms, the pain and abdominal distension improve and the patient becomes more comfortable.

Therefore in late operations for acute appendicitis where a distended cecum is a feature and also in bad peritonitis cases, Wilkie of Edinburgh advises that cecostomy be done at the original operation, placing a tube into the distended cecum, inverting the walls of the cecum over the tube to provide a valve-like opening which will allow the fecal fistula to close after removal of the tube. This procedure at first operation may forestall an inevitable oncoming ileus. This cecostomy can also be employed postoperatively after ileus has developed by opening the operative wound and exposing the distended cecum.

Then we have the life-saving procedure of doing an enterostomy, which has become so popular during the past few years. The practice of opening the abdomen in the midline under gas-oxygen or local anesthesia and inserting a small tube into a distended loop of bowel has relieved a great many cases of postoperative ileus and saved many a moribund patient.

But, again, many such enterostomies have proven a disappointment, especially if the loop

selected has been low, for instance in the ileum, where perhaps a small amount of gas has been liberated, but little or no toxic bowel content has escaped. In some such desperate situations a second enterostomy done higher up, for instance in the jejunum, has proven successful in reaching and removing large quantities of toxic fluid and flatus, thus decompressing the distended abdomen and relieving the ileus.

Therefore, it has become a more frequent practice of late years to insert a tube high into the jejunum, thereby making quite certain that the liquid contents of the upper intestines are reached and drained. This part of the bowel can perhaps be reached most easily and with less interference by a muscle-splitting incision three inches to the left of the midline, slightly above the umbilicus.

Hayden and Orr, of Kansas City, after a series of animal experiments on dogs to test out the value of high jejunostomy in acute high obstruction, have come to the conclusion that jejunostomy on dogs was not a life-saving procedure, but that it was an added surgical hazard which increased the mortality rate instead of decreasing it. They can not correlate their discouraging results on dogs with the favorable results reported by many experienced surgeons, but they add that the results on dogs may not run parallel with human beings. They found that in these experimentally obstructed dogs there was always a deficiency of chlorides in the blood, and that intravenous infusion of a two to five per cent sodium chloride solution in large quantities gave better results than enterostomy alone or than sodium chloride and enterostomy combined.

McVicar also makes the observation that the toxicity of the regurgitated fluid has not been determined and its removal is not always the essential part of the treatment, and that when the tide can be turned and peristalsis renewed and the fluids be directed downward, they become useful and do not produce further toxic symptoms. Therefore he lays more stress on supplying fluids, chlorides and nourishing carbohydrates under the skin and into the veins than on removing the toxic stomach contents by continued lavage or jejunostomy.

The dramatic relief of some cases of ileus by jejunostomy might possibly then be explained, not by the removal of toxic intestinal contents but by the decompression of the tympanitic par-

alyzed bowel, allowing it to regain sufficient tone to start up normal peristalsis.

The treatment then is not always the same; there is not yet any outstanding remedy which will relieve all cases. Intravenous and hypodermic introduction of sodium chloride or carbohydrates and water particularly seems to be of more importance than other remedies; removal of stomach and duodenal secretions by means of lavage, or the duodenal tube or jejunostomy is evidently life saving in many cases, perhaps not due to removal of toxic contents so much as to relief of distension, allowing muscle tone of the bowel and peristalsis to be renewed.

Early recognition and a timely understanding of the real situation is not an easy matter, but demands strenuous concentration and a most exacting studious frame of mind, taking notice of the minutest detail, work from which we often shirk.

It is helpful to be alert early in the course of every postoperative abdominal case, and to sense the approaching danger in order to prepare for action in advance.

The patient has perhaps had only the most meager allowance of food or even none for several days. A certain amount of starvation is present and he needs nourishment therefore, which must be given mostly by the intravenous route. Loss of body fluids is a vital loss which can be estimated as the hours pass by, and this must be replenished intravenously or hypodermically.

Body heat lost by fever, evaporation, sponge baths and cold applications has used up energy, and the patient is weak and prostrated and needs absolute rest and preservation of heat. The preservation of heat seems to me to be just as important in these toxic ileus cases as it is in the case of shock.

The patient is exhausted mentally and physically, tired almost to death, and his treatments should be timed so as to allow rest periods, assisted at times by hypnotics.

*Summary.*—Postoperative ileus, whether paralytic or obstructive, tends to produce a fatal toxemia or shock complex, the real nature of which is not yet understood.

A large number of these postoperative ileus cases are actual obstructions, due to localized peritonitis causing adhesive kinks.

There are a relatively small proportion of cases following operative irritation of bowel, rough handling and extra-abdominal injury, which are difficult to explain on any but a nerve-disturbance basis.

The higher the intestinal stasis the more toxic the obstructed bowel contents seem to be.

Early diagnosis of oncoming postoperative ileus is so important that in any postoperative abdominal case in which one or two enemas have not relieved, and where lavage is followed in three or four hours by further vomiting, a careful watch should be kept for a falling blood pressure, diminution of urinary output, absence or loss of chlorides in the urine, and blood studies, especially with reference to lowering of blood chlorides, increase of carbon dioxide combining power and increase of non-protein nitrogen should be made.

Undoubtedly many cases of postoperative ileus are averted or cured in the earliest stages by the timely administration of fluids, sodium chloride and glucose, before a definite diagnosis has been made, and thus go by unrecognized.

In the treatment, the replenishing of fluid loss is perhaps of first importance; the introduction of chlorides under the skin or into the vein is perhaps of next importance; the supplying of nourishing carbohydrates intravenously should also be done early; in fact, these three can be done simultaneously to great advantage, and must be repeated at definite intervals throughout the illness, no matter what further treatment may be found necessary. The intestinal contents as they regurgitate into the stomach should be repeatedly removed by lavage, or by retained duodenal tube, or if relief is not produced after a few hours' repetition of these procedures, the distended abdomen should be decompressed, preferably by high jejunostomy, or if the ileocecal region is strongly suspected of causing the obstruction due to operation for appendicitis, then the operative wound can be reopened and a cecostomy tube inserted.

If conditions improve after these procedures, but obstruction of the bowels still persists, further operation may be indicated to find and relieve the obstruction.

Rest can best be obtained by relief of the abdominal distension but also by grouping different relief-procedures systematically so as to allow definite rest periods.

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## THE HEALTH ANGLE IN ADVERTISING

The physician has become a prophet in the land, and health is the word with which one conjures. Regardless of the substance to be advertised, the agency goes forth in search of medical opinion with which to vaunt it. A soup is sold with the claim, "There is health in every spoonful." Of certain toilet accessories it is said, "Your doctor will advise against harsh, rough papers." Certified milk is called "health bottled in bond." And so it goes. The doctor's advice has been sought, it seems, for many of the most mundane affairs of human existence. The difficulty of evaluating advertising copy in these modern times is an evidence of the changing situation. The modern agency supports by evidence the claims for the products promoted. The presentation of such evidence often seems an exaggeration of conditions as they are, yet the evidence is almost invariably actual. No doubt physicians have been too ready to accept broad generalizations in the field of hygiene. They seldom require the same kind of evidence in support of a cleansing agent, dietary product or tobacco that they demand in support of a new remedy. Hence the promoters are easily able to secure the necessary number of medical endorsements. Fortunately the situation may take care of itself: the overdoing is certain to result in reaction. But if the great minds in the advertising agencies are wise they will begin to reconsider now. Otherwise the good is likely to be lost with the evil. (*Jour. A. M. A.*, December 24, 1927, p. 2195.)

## THE VIAVI FAKE

For years there has been exploited throughout the United States a piece of quackery known as "Viavi." The business was founded by two brothers, Messrs. H. and H. E. Law, San Francisco. Viavi is not the name of a single preparation; it is a generic name given to a long list of nostrums put out by the Viavi Company. Practically all of the preparations are sold for the alleged alleviation and cure of diseases peculiar to women. The basis of most of the Viavi preparations seems to be golden seal. Some years ago the California State Journal of Medicine published a detailed exposé of the Viavi quackery. In general Viavi had not been advertised to any extent in newspapers. However, immediately Viavi advertisements appeared in all the San Francisco papers and no further newspaper criticism appeared. A physician reports the case of a woman with unmistakable evidence of cervical carcinoma of several months' standing. The history of the case was that the young woman, some four months previously, instead of going to the family physician, fell into the hands of the the local Viavi agent. Finally the Viavi people told the woman she had cancer and recommended that the sufferer go to Detroit and take the Koch treatment! Before the poor woman could decide what to do, the lesion ulcerated into an artery. The family physician writes: "Four months ago there might have been a chance to save the life of this young mother; today, the case is practically hopeless." (*Jour. A. M. A.*, December 3, 1927, p. 1983.)

## ACUTE APPENDICITIS IN YOUNG CHILDREN\*

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**A**PPENDICITIS continues to be discussed because it still carries a mortality which may be considered largely preventable. In spite of the fact that acute appendicitis presents a fairly characteristic syndrome, the diagnosis remains in doubt in many cases, and, as a consequence, fatalities occur with relative frequency.

The diagnosis of appendicitis in children is peculiarly difficult. The classic picture of abdominal pain, localized in the right lower quadrant, accompanied by nausea, emesis, slight fever, and the objective symptoms of tenderness and rigidity over McBurney's point, unfortunately are often absent. In children aged five years and more the absence of some of the classic symptoms or signs may raise doubt in the mind of the physician, although usually an accurate diagnosis is possible. In older children, as in adults, the question of differential diagnosis arises, although the number of probabilities to be considered is perhaps smaller.

In young children the problem becomes difficult since scarcely any information may be gained concerning the subjective symptoms, and that which can be obtained objectively is limited by the difficulties of making a satisfactory examination.

Acute appendicitis in children offers too broad a field for complete discussion here, therefore only a few suggestive points can be touched on, which principally concern children aged five years or less. Appendicitis at this age is not rare. Many cases have been reported in children aged less than two years. It is extremely significant that in these reports the majority of the diagnoses were made after death. In a group of 288 cases in children, seen in the Mayo Clinic during the last three years, the incidence according to age is shown in Figure 1. Distribution of the acute and subacute cases according to years is practically the same. It is only when the chronic cases are included that the increasing frequency after five or six years of age becomes evident.

At present it is generally agreed that the treatment of early acute appendicitis consists of immediate removal of the diseased organ. The difficulty in diagnosis becomes apparent when one considers the number of appendices that perforate before treatment can be instituted. With perforation and consequent peritonitis, the outlook becomes more grave, the illness is prolonged, and the mortality is increased.

If one compares the incidence of acute appendicitis according to years with the occurrence of perforation according to the age of the child, it is readily seen that perforation occurs more frequently in the earlier years, in inverse ratio to the age of the patient (Figure 2).

The mortality rate for the entire group is 2.25 per cent, which compares favorably with the percentage of 2.5 in a similar group reported by Bolling. Although death occurred only six times in the group discussed here, rupture necessitated a prolonged stay in the hospital whenever it occurred.

It is important to consider the causes which bring about perforation and death from acute appendicitis in these children, in an effort to prevent such unfortunate results from a disease for which there is a cure if treatment is instituted in time. It is delay, particularly, which accounts for the accidents. Older children can describe pain and other subjective symptoms dependably. In the younger children this important aid in diagnosis is lacking; consequently appendicitis frequently proceeds to perforation with resultant peritonitis or abscess formation before the true condition is suspected.

### SYMPTOMS

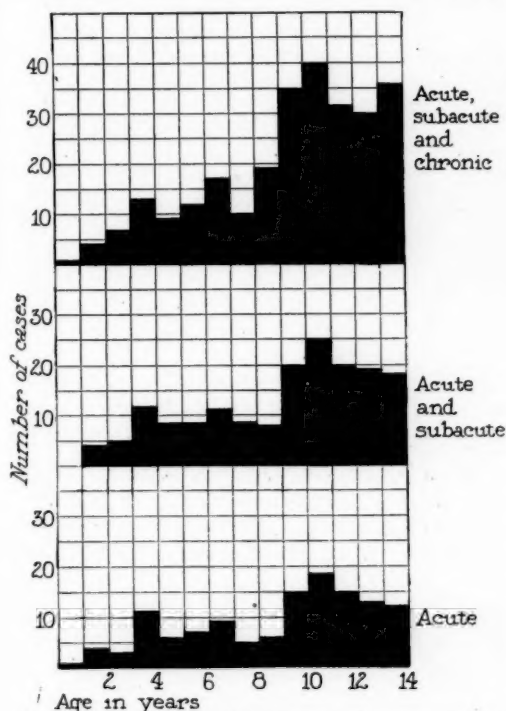
**Pain.**—Pain is probably always present in appendicitis, but in the young child is likely to be interpreted as stomach-ache which will disappear, especially if a cathartic is given, a practice condemned by most thinking members of the profession. It is often impossible to determine the situation of the pain. Indeed, the little patient may indicate that it is in an entirely different part of the body. Often one must be satisfied with the knowledge that the child has pain.

\*From the Section on Pediatrics, Mayo Clinic. Read before the Northern Minnesota Medical Association, St. Cloud, Minnesota, September 12-13, 1927.



**Nausea and emesis.**—Young children vomit more easily than older children and usually do so at the onset of an acute infection. Since there is nothing characteristic of the emesis it is of little help in diagnosis. The relation of emesis

mining whether the palpating hand meets involuntary resistance or causes pain on pressure. If there is tenderness the child will cry or make resistance; if there is none, he will cry no more loudly. The presence or absence of rigidity is



Age incidence of 288 cases of appendicitis in children

Fig. 1.

to pain may, however, be of great importance. Emesis which does not relieve pain is always suggestive of peritoneal irritation or inflammation of an abdominal viscus.

**Fever.**—Fever is usually present and is characteristically low. Rectal temperatures of more than 102° are seldom encountered except in cases of peritonitis following perforation of the appendix.

**Tenderness and rigidity.**—Tenderness and rigidity constitute the most dependable indications of acute inflammation of the appendix in young children. Those who have attempted to examine well children realize that it is difficult to elicit these signs without the coöperation of the child and that patience and perseverance are required. However, one is well repaid for the time spent in gaining the confidence of the child and deter-

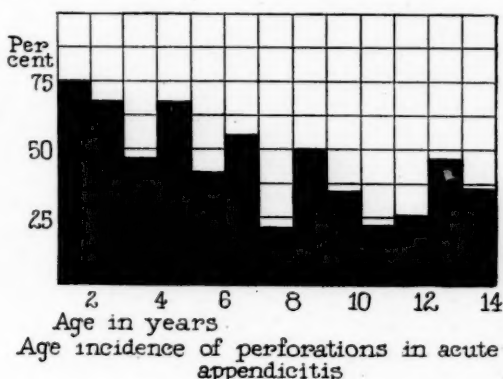


Fig. 2.

determined by comparing the tension of the lower ends of the rectus muscles. If both tenderness and rigidity are present there is sufficient evidence to justify exploration. The location of the point of maximal tenderness, although subject to considerable variation, is of importance. In general, the appendix is situated higher in children and in not a few is retrocecal, which accounts for the lack of uniformity in the point of tenderness. Tenderness is frequently not extreme; in many instances it can be elicited only by deep palpation; however, if difference is noted in palpating the two sides of the abdomen, the evidence must be considered positive for appendicitis. In an occasional case, tenderness will be found, only to disappear in a few hours. On the other hand, it may increase and if, in addition, the area of tenderness becomes larger there is reason to suspect rupture with peritonitis.

**Rectal examination.**—Besides localized tenderness in the right lower quadrant of the abdomen, tenderness on the right side on rectal examination is of utmost importance. The difficulty encountered in making a satisfactory abdominal examination in a young child is usually not so great as the difficulty of making a rectal examination and consequently the latter requires even greater confidence from the patient. Here, too, a comparison between the two sides must be made. Practically every child will object to the discomfort when the examining digit is intro-

duced into the rectum, but if there is inflammation in the right iliac fossa or at the pelvic margin, the increased tenderness on the right side will be evident.

**Blood count.**—The leukocyte and differential blood counts are usually an aid in diagnosis, especially after other acute infections have been ruled out by the general examination. Seldom is the leukocyte count less than 12,000. If, besides leukocytosis, the polymorphonuclear cells are above 80 per cent the evidence of acute infection becomes strong.

#### DISCUSSION

Several times in the last few years I have encountered a condition which presents the clinical syndrome of acute or subacute appendicitis with definite tenderness and more or less rigidity in the right side of the lower part of the abdomen. At operation the appendix has been found to be inflamed in about 50 per cent of the cases. In the others the appendix has been practically normal, but the mesenteric nodes, especially the ileocecal node, have been enlarged. On microscopic examination there was evidence of hyperplasia and inflammation. This is not an original observation, but it is important enough to deserve mention as it will account for the diagnosis of appendicitis in some cases in which the appendix appears to be almost normal at operation.

If all cases of acute appendicitis could be recognized and treated in the first twelve, or possibly twenty-four, hours after onset, few deaths would occur from this disease. Abdominal pain and tenderness are the chief warnings of trouble and when they occur in older children receive more or less prompt attention. In the younger child the tendency on the part of the parent and physician is to minimize the significance of the

stomach-ache and, because they do not suspect appendicitis, they delay examining for it. The result is that the diagnosis is frequently made only after perforation, peritonitis, and even death have occurred. The conception that appendicitis develops more rapidly and proceeds to perforation more quickly in young children is probably only half true. Less than one-fourth of the children five years of age or less with acute appendicitis were seen in the first twenty-four hours; a diagnosis was not made before two days in a larger number and more than a third were not brought for treatment until after the second day.

#### SUMMARY

Appendicitis carries a mortality which can be decreased by early diagnosis and prompt treatment.

Acute and subacute appendicitis occur at all ages, and in young children nearly half as often as in older children.

In young children the diagnosis is particularly difficult, chiefly because of the patient's inability to describe subjective manifestations and because of difficulty in making a satisfactory examination.

Perforation occurs in young children from a third to a half again as often as in older children.

Tenderness and rigidity are of most significance in very young patients.

Enlarged, inflamed lymph nodes may simulate acute appendicitis.

If a child has an acute complaint, referable to the abdomen, acute appendicitis should be suspected, the child watched closely, examined carefully for evidence of a diseased appendix and treated promptly when positive signs are found.

## THE MIGRATORY CONSUMPTIVE PROBLEM\*

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THE purpose of this study is the consideration of the problem of the non-resident consumptive as it affects the sanatorium serving the largest community in this state. It will include an attempt to adjust the conflict which exists between the laws defining those who are eligible for admission to a county sanatorium and the humanitarian and public health aspect of the problem; as well as a consideration of the burden that the care of the non-resident places on any community.

The linking of climate and disease in the mind of man is as old if not older than the history of medicine. The ancients<sup>1</sup> believed that certain climatic conditions produced certain types of diseases, while other climatic conditions produced a curative effect upon the disease or prevented its development entirely. Now we know that the development of these diseases depends not upon the climatic conditions but upon the presence of certain germ-bearing insects. Where these insects cannot live the disease does not develop, and when these insects are exterminated the disease dies out. Gradually climate has come to occupy a less important place as a curative factor in the development of certain diseases.

Tuberculosis was one of the diseases which the ancients associated intimately with climate. The fact that when a new land was discovered, no evidence of tuberculosis could be found, led to the belief that there were certain localities where tuberculosis could not develop. However, tuberculosis appeared soon after the advent of the white man, proving that these localities which had been free from tuberculosis were merely localities which had not made contact with the tubercle bacillus rather than "immune areas." This fact apparently had no influence on common opinion because even as late as the middle and latter part of the 19th century Brehmer,<sup>2</sup> the father of the sanatorium treatment, recommended that all sanatoriums be located in so-called "immune areas." Some considered that

altitude was all-important, and for others the sea coast was the favorite spot. Laennec<sup>3</sup> was so impressed by the beneficial effect of sea air that he attempted to create an artificial sea atmosphere in his hospital wards.

In the long ages which have passed since the beginning of medical practice, the value of climate in the treatment of tuberculosis has been so impressed on the mind of the layman that he firmly believes that, if he can only reach the elusive, tantalizing, and not-to-be-found Fountain of Perpetual Youth, personified in an ideal climate, he will recover from his tuberculosis. For this, man will give up his family, friends, and established life, and expend large sums of money to migrate thousands and thousands of miles in the hope that his life may thus be prolonged.

With the development of the sanatorium method of the treatment of tuberculosis, another factor was added to that of climate as a cause of the migratory consumptive problem. This factor was the faith in a certain sanatorium, and the belief by the individual that if he could only get into that sanatorium or under the direction of the physicians of that sanatorium he would get well. Such a faith was responsible for the development of the tuberculosis colony which has grown up around Trudeau Sanatorium, near the village of Saranac Lake, New York. These two causes then, climate and sanatorium care, are the foundation of the migratory problem of all communities.

The popularity of Minnesota as a health resort for tuberculosis is not new. Men who are familiar with the early history of Minneapolis state that in the early days nearly every house had its boarder, and, according to some, "the dry air of Minnesota in 1880 was responsible for the increase in population in Minneapolis in three years from 47,000 to 75,000." The popularity of Minnesota's climate for the tuberculous is now surpassed by that of the Southwest, but other factors have taken its place, which continue the problem and even increase it.

The first factor is our large floating popula-

\*Presented before the Minnesota Hospital Association in Duluth, June 25, 1927, and the Minnesota Sanatorium Association at Granite Falls, Minnesota, July 14, 1927.

tion. Minneapolis is conceded to be one of the largest labor markets in the country. This creates a large floating population which, while not strictly resident in the terms of the law, considers Minneapolis its headquarters. These individuals earn their money elsewhere and spend it in Minneapolis. They contribute something to Minneapolis, and, therefore, are entitled to something in return. This something is the advantages of the hospital facilities which the community affords. Whether the contribution these people make is valuable enough to warrant this care may be questionable, but as long as the community accepts the contribution it should be willing to render the care.

The second factor is the Minnesota sanatorium system, which is one of the best in the Union. It is composed of one state sanatorium and fourteen county sanatoriums located at various parts in the state and varying in size from thirty and forty beds in the smaller centers to seven hundred beds in the largest community. All attract people who are in need of sanatorium treatment for tuberculosis from the surrounding communities.

These two factors, the large floating population in Minneapolis, and the facilities which the largest sanatorium in the state affords, make up the migratory consumptive problem of Minneapolis. The details of this problem pertain to one sanatorium but the broad general principles apply to all county institutions.

The migratory consumptives can be divided into two classes.

One class includes those who are residents of the state of Minnesota and of the sanatorium district but who enter the sanatorium in the fall and leave it in the spring only to reenter in the fall. These do not present a difficult problem as they are residents and should receive the same consideration as any resident with respect to place on the waiting list, the stage of the disease, and the admittedly better ability of the sanatorium trained individual to continue home treatment with all that that implies, than a non-sanatorium trained individual, both from the personal and the public health point of view. This is easy of solution and will not be considered further in this paper.

The other is the non-resident group. This group may be divided into two sub-groups;

(a) the well-to-do who can be hospitalized in a private hospital, and (b) the person in less fortunate circumstances who has to be hospitalized in a public sanatorium. No problem arises in the hospitalization of the well-to-do man in a private hospital as long as his funds are ample. But when he is no longer able to pay the hospital bill and support his family, if he has one, the question of care in a public institution and relief for his family or the deportation back to his former community arises. In attempting to solve this an effort should be made not to break up the family. Therefore, the man and his family should be treated as a unit, and either cared for or else deported. As long as a man is independent we grant him the right to live, to earn his bread, and to educate his family where he wishes, but that right is justly questioned when he becomes a burden on the community, as he does when he enters a public institution. But the urge to get well is as strong in the poor as in the well-to-do, and each one, rich or poor, will go where he thinks health is available, whether the lure be climatic advantages or hospital facilities.

#### THE CARE AND TREATMENT OF NON-RESIDENTS IN A PUBLIC INSTITUTION

As the sanatorium system of Minnesota includes a State Sanatorium as well as county institutions, no discussion of the care of non-residents in a public institution would be complete without considering the State Sanatorium and its relation to this program.

Admission to the State Sanatorium is limited to residents of the state, as defined in Section 3161, General Statutes of 1923, who have incipient or favorable tuberculosis. This law defines a resident of the state for the purposes of hospitalization in a public institution as one "who has lived in the state for at least a continuous year immediately prior to hospitalization, in absolute independence and without aid or support from the community." This law further specifies that "each month any aid is received or each month that the individual is an inmate of a hospital, insane asylum, or other public institution, shall be deducted in determining the time of residence." This law is a clear recognition of the principle that each state should care for its own dependents and should not pass the burden of the erection and the maintenance



of tuberculosis sanatoriums on to other states. It is also a recognition of the contention that when an individual needs care in a public institution it should be given by the community to which that individual has contributed something by living or working rather than a new community to which he has come for a special purpose. If a community did not safeguard itself in this manner, where would the demand for hospitalization end? How many public sanatorium beds would that community have to provide and how large a burden would such a program place on the tax-payers? The question is frequently asked, "But if I pay cannot I then be admitted to the public institution?" Of course, a state in self-defense could erect enough beds to care for all of its bona fide residents and provide for individuals of a sister state, who would be admitted upon a pay basis which would cover the maintenance of such institutions, including the interest on the money invested. This, however, would be an encroachment on the prerogatives of the private sanatoriums, such as the two excellent ones that we have in the state of Minnesota. Therefore, it seems to me that it is unnecessary and should not be done.

Thus the state has theoretically and practically no non-resident problem. The law limits admissions to the residents of the state as defined above and the poor relief is on a city or county basis. If the State Sanatorium refuses a case, the burden falls back on the county, and there it has to be solved. The sick, homeless, destitute man or woman must be cared for.

#### THE CARE OF THE NON-RESIDENTS IN A COUNTY SANATORIUM

Because of state aid, the County Sanatorium Law provides that the county sanatoriums, while giving preference to the advanced cases, shall first care for the residents of their own sanatorium districts, and, if any vacancies then remain, residents of other counties may be admitted upon a non-resident basis. This is the payment of a certain weekly charge, the exact amount being determined by the state supervising body. A county resident, as defined in Chapter 15, Section 3161, General Statutes of 1923, is "a person who has resided one year continuously in any county . . . or, if he

has only resided one continuous year in the state, he shall have a settlement or residence in the county in which he has longest resided within such year." In addition this time must have been spent in absolute independence and outside of a hospital, as in the State Law. Also, "the residence of a minor, unless he is independent in his own rights, is with his parents."

Thus, for the purposes of public hospitalization it is impossible to acquire residence in any community by spending the required period of time in a hospital. Residents of the state who are not residents of Hennepin County may be cared for in Glen Lake Sanatorium or in any other county sanatorium in the state, provided there are vacant beds and no residents of the sanatorium district on the waiting list, upon the payment of \$19.25 per week, the amount fixed by the State Board of Control for the care of such non-residents. In addition, Section 726, of the General Statutes of 1923, authorizes and empowers the various county boards "to appropriate money out of the general revenue funds of the county . . . for the care, support, and maintenance, of poor persons who are afflicted with tuberculosis." As the law does not specify where this care, support, and maintenance must be given, the Attorney General's office has interpreted it to mean that such care may be given in any sanatorium or hospital, public or private, in the state of Minnesota, wherever there happens to be a vacancy. One county has hospitalized about twenty-five patients in two general hospitals in its community, and Hennepin County through Glen Lake Sanatorium has hospitalized patients in a private sanatorium during the winter of 1926 and 1927. Also, in 1925, the state passed a law (Chapter 213) to the effect that individuals who have not resided in any one county in the state long enough to establish a residence in any county could be admitted to the State Sanatorium or to any county sanatorium at the expense of the state, and the cost of hospitalization of such a person would be paid out of State Aid funds.

With such careful laws defining eligibility for the care and treatment of a tuberculous individual in a county sanatorium at the expense of the taxpayers of that county, and for the provision of hospitalization of residents of other counties in the state, either at the expense of their own county or at the expense of the state, theoretic-

cally there should be no migratory consumptive problem in any county sanatorium district.

However, during the past three years, or since Glen Lake Sanatorium has assumed the hospitalization of all of the tuberculous in Hennepin County, through an agreement with the Board of Public Welfare of Minneapolis, our migratory consumptive problem has increased. During that period we have had 123 applications of non-residents who under the law were not eligible for treatment here.

other cases lived in an adjoining county which did not maintain a sanatorium. They were too far advanced to go to the State Sanatorium and so they were given temporary care at Glen Lake Sanatorium from the humanitarian point of view. Later, arrangements were made to transfer them to a private sanatorium where they are now cared for at the expense of their own county under the laws referred to above. Twenty of the cases were admitted because of the unfavorable home conditions, or because of the public

#### NON-RESIDENT APPLICATIONS

Rejected		Admitted		Waiting	TOTAL
Out of County	In County	Minn. Resident	Other State		
74	4	18	15	12	123

Table 1

Of that number, seventy-four who were not in the county at the time of application and four who were residing here temporarily were rejected. However, Glen Lake Sanatorium was forced, for various reasons, to admit thirty-three of the non-residents, and there are twelve still on the waiting list. The problem is, what to do with the thirty-three and twelve, or a total of forty-five non-residents. Of the thirty-three admitted, eighteen were residents of other counties in the state and fifteen were residents of other states or countries. All were definitely non-residents and should have been cared for by their own community.

In analyzing these cases the entire thirty-three will be considered as a group, with an occasional reference to special groups or cases. Three lived in hospitals in the city of Minneapolis for over a year and would not now be admitted under that basis. In six cases the family moved here with the idea of establishing a permanent residence and lived in the county from six weeks to nine months before admission. One of the six sent her children here after the death of her husband and she herself purchased a home in Minneapolis, thus declaring her intent to make this, rather than the town of her previous residence, her future home. One was a minor whose father lived here six years prior to the child's admission to the United States, and one case had been employed at the Sanatorium for six months. Two

health problem which their residence in this community presented.

When the family moves here and establishes a home, thus declaring its intent to make Minneapolis or Hennepin County its future residence, we will have to admit the sick one. According to common opinion, the children of such families are entitled to the educational advantages the community has to offer. The question naturally arises, should they not also be entitled to the

#### REASONS FOR ADMISSION TO GLEN LAKE

- 3 Hospitalized in other hospitals in Hennepin County for 12 months or more.
- 6 Family moved here and established a home.
- 1 Minor whose father lived here.
- 1 Employed at the Sanatorium for 6 months.
- 2 Lived in adjoining Counties—given temporary care.
- 20 Admitted for Public Health reasons.

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33

Table 2

public health advantages? Some feel that our educational system should be of such a character that it will attract people from other communities to Minneapolis, but they believe that our hospital facilities should not be on such a high plane.

As the responsibility for the care of the residents of any county is clearly defined by the sanatorium laws, Hennepin County should be able to give emergency care to residents of other counties who are temporarily in Hennepin Coun-

ty and secure the proper authorization for transfer later. Actually, however, we have found that after giving temporary care the home county is much more loath to assume its just responsibility than if we refuse such emergency care. The following case illustrates our difficulty in this matter.

A woman born in Minnesota was married in one of the northern towns of the state. After nearly ten years' residence in the town, her husband developed tuberculosis and the family migrated to the Southwest, where two and a half years were spent in three localities in search of health. Finally the husband died in Arizona from a ruptured appendix and not from tuberculosis, and the wife and children returned to the town of their former residence, where the family was granted mother's or widow's pension by the county. After a few months the widow was found to be a case of advanced tuberculosis. Her children were placed in the Odd Fellows Home at Northfield, Minnesota, and she herself came to Minneapolis. As she was an advanced case with positive sputum she was admitted to Glen Lake Sanatorium for emergency treatment and immediate steps were taken to secure her transfer back to her own county, which operates a county sanatorium. To date, all attempts to transfer her to her county, which, by giving her mother's or widow's pension after she returned following the death of her husband, admitted that she was still considered a resident of that county, have been futile. The question naturally arises, has this woman lost her residence in her former county because of her sojourn in the Southwest? According to Section 3161, Chapter 5, General Laws of 1923, "a settlement for poor relief purposes in this state is terminated first by acquiring a new settlement in another state and second, by voluntary interrupted absence from this state for a period of one year with intent to abandon the residence in this state." The Attorney General's office has interpreted that to mean "that if a person leaves the state temporarily, even though for a period of one year, without any intention of abandoning his residence here and for the purpose of curing an ailment, that residence in this state would not be lost." Where was the intent to abandon residence in Minnesota in this case? There was none. The family left the state temporarily for a specific purpose and intended to return to the home town when the need for such a sojourn was terminated, either by recovery or death. One might debate the question as to whether this woman is entitled to care in Minnesota at all because of her sojourn in other states for a period of two and a half years, even in spite of the Attorney General's opinion. There can, however, be no dispute about the fact that Hennepin County has no responsibility in the case. She has never worked here, she has never lived here, and has never contributed anything to the support of Hennepin County; still for humanitarian and public health reasons it has assumed the cost of the care of this case. We should not have to continue it.

It was suggested that more accurate information concerning the residences of the various applicants could be secured if they were required to make out an affidavit. The Sanatorium received that idea with alacrity and then found a man falsifying on his affidavit. What was to be done then? Should the man be prosecuted for perjury?

A Mr. R. had lived in Minneapolis for a number of years when his two children developed tuberculosis. He moved to California. The boy died there; the girl recovered sufficiently to marry, and, following the birth of her child, had a relapse. The man then decided to return to Minneapolis with his family and take up his residence here again. In making application for his daughter, he perjured himself, and when the perjury was discovered he gave the following defense. "I was up against it. My money was gone, my one boy dead from tuberculosis, my daughter dying from the same disease, and I knew that if I told you the truth I could not get her into Glen Lake Sanatorium. However, I believe that I am justified in this because I have to support her and her husband and child. I have been a taxpayer for a long time and therefore I believe I am entitled to some consideration." This man, while he perjured himself, was doing it as a last resort in an attempt to secure care and treatment for his loved one at a cost which he could afford.

The law frequently refers to intent to abandon the residence or to establish a permanent residence in any given community. That intent can change with the tide and with the necessity as is well illustrated by the following case.

Things were not going well on the farm, and so a family decided to leave a farm, located in another state where the ill person had resided for about forty years, till farm conditions improved. They moved to Minneapolis, where they had many friends and relatives, and after about six months' residence the wife was discovered to be an advanced case of tuberculosis. Her friends and relatives claimed that she was eligible for admission to Glen Lake Sanatorium because she "intended" to make this her permanent home. Now that she is about ready for discharge she informs me that she is going back to her former state. What was the "intent" in this case? It was merely the subterfuge which she and her relatives used in order to secure her admission to Glen Lake Sanatorium.

Of the thirty-three cases admitted, three have had a residence in Minneapolis at some time, but while they have lost it, still their parents retained it. Naturally, when they became ill they wished to return to their former home. Seven of the thirty-three cases have never lived in Minneapolis, but had relatives living here and came to Minneapolis to receive hospitalization near their

relatives. This point is well illustrated by the following case.

A girl had lived in a certain town in Minnesota for eighteen years and then her family moved to Canada. While there she developed tuberculosis and was about to enter a sanatorium in Canada when one of her uncles in Minneapolis died. The family came to Minneapolis to attend the funeral and then decided to remain because of the health and educational facilities which this community has to offer. Whether this woman was a resident of Minnesota might be questioned, but there can be no dispute about the fact that she was not a resident of Hennepin County. If she should be cared for at all in Minnesota at public expense, it should be either at the expense of her former county or the state, and not at the expense of Hennepin County. When asked why she should be cared for in Hennepin County, she replied, "I have many relatives here who are taxpayers." Of course, the fact that her relatives were taxpayers of this community did not entitle her to care and treatment in Glen Lake Sanatorium.

If any county attempts to care for all of the relatives of its residents where will the load stop? How large will the Sanatorium have to become, and what will be the burden imposed on the taxpayers of the community?

The following table shows the length of residence of the thirty-three cases in the county and state.

Residence in County		Residence in State	
Cases		Cases	
2	Not in county at all.	2	Life—later transferred to a private hospital.
2	6 weeks	1	18 to 20 years but lost residence by moving. Returned because parents lived here.
		1	33 years—out 5 years. Returned because married children lived here.
2	2 months	2	21 years.
4	4 months	1	35 years.
		1	25 years.
		1	Life.
		1	18 years, then out 5 years, and in state 4 months.
4	6 months	3	Life.
7	7 months	1	Born here—out 5 years.
		1	11 to 14 months.
		2	Life.
		1	26 years.
4	8 months	3	7 months.
		2	Life.
		1	8½ months.
		1	In and out for 10 years.
3	9 months		For life.
2	11 months		11 months.
1	13 months		13 months
2	14 months	1	14 months.
		1	Life.

Table 3

Of the thirty-three cases admitted, three have been transferred to other hospitals or sanatoriums and are cared for there at the expense of their own county; two have died; two have left the Sanatorium either upon the advice of the staff or against it; and twenty-six are still being cared for at the expense of the taxpayers of Hennepin County, and all attempts at effecting a transfer have been unsuccessful. This makes Glen Lake Sanatorium all the more determined in the future to do all that it can to prevent the admission of non-residents even for emergency treatment. If Glen Lake Sanatorium had found that these people could be admitted and then transferred it would be very glad to render such emergency treatment and temporary care as is necessary, but when a transfer cannot be effected then the Sanatorium is very loath to admit them on any basis whatsoever.

#### THE BURDEN ON THE COMMUNITY

Two of the cases were paid for by their own county. These later were transferred to a private sanatorium. One of the thirty-three cases was a full pay case, paying twenty-one dollars per week; four cases paid from three to ten dollars per week; and twenty-six are free cases.



The cost of hospitalizing these non-residents in the Sanatorium does not represent their entire cost to this community. This, of course, depends upon the age, the sex, the civil and financial status of the individual, or upon whether the individual was the wage earner or the mother of the family. Two of the families have cost the community five hundred and thirteen hundred dollars respectively in addition to the cost of hospitalization.

Of the twelve non-resident applications on the waiting list, nine are residents of the state, either floaters in the state of Minnesota or with a well established residence in some other county, or are young people who are students at the University. Three of these are out-of-the-state residents, and present quite a problem. If the conditions become so acute that we are forced to take any or all of these cases, either because of the public health aspect or the humanitarian side of the problem, they will further complicate an already acute situation. If we have to admit them all we will have to hospitalize forty-five non-residents, which number would fill a small sized sanatorium. That number of beds released for the care of our own residents would aid materially in the care of our waiting list, which for the last two winters has averaged about fifty.

The next point to be considered in the migratory consumptive problem is that of the public health of the community. The indigent floater is usually ignorant, careless, and a danger to those about him. While he may not be legally a just charge of the county, still he is subject to the public health laws of the community in which he is living no matter where his legal residence may be. Also, since the sanatorium is supported by taxation, the welfare of the group is to receive precedence over the welfare of the individual. Therefore, if the health officer of any community requests that any non-resident be hospitalized, his request should be granted even if hospitalizing the non-resident excludes a bona fide resident from the Sanatorium. In attempting to adjust the public health demands of the community to the laws concerning the right of people to receive hospitalization in a publicly supported hospital, the social worker must use sympathy and understanding mingled with firmness in order to see that justice is received both by the non-resident and the resident who is applying for admission as well as the taxpayers who are supporting the institution.

*Summary.*—Eighteen of the thirty-three non-residents were admittedly residents of other counties in the state of Minnesota and fifteen were residents of other states. All of the eighteen who were residents of other counties could have been hospitalized at the expense of their own counties under the Sanatorium Law in any county sanatorium in the state wherever there happened to be a vacancy; or in any private hospital or sanatorium in the state under Section 732 of the General Statutes of 1923, if their counties had been willing to meet their obligation instead of passing it on to Hennepin County. As stated before, one county has hospitalized over twenty-five patients in general hospitals in its district, and Hennepin County has hospitalized some patients at a private sanatorium at the expense of the Sanatorium Commission. If other counties would do likewise there would be no inter-county non-residence problems. Fifteen of the thirty-three cases admitted, however, were residents of other states and this presents an entirely different problem. Each state is a unit by itself and has its own set of residence and poor laws. Furthermore, there is no law providing for coöperation between states as the county sanatorium law provides for coöperation between counties. This should be a problem for the entire state rather than for any one county and the state rather than any one county should assume the burden of either hospitalization or of the deportation of these cases.

#### RECOMMENDATIONS

1. That, except in the large counties, the county sanatorium system be changed to a district sanatorium system. This will extend the sanatorium facilities to more counties and at the same time increase the capacity of the present institutions.
2. The establishment of a strong central policy by the state supervising body which should include definite rules and regulations governing the hospitalization of these non-residents with the understanding that they will be strictly adhered to by each county.
3. The assumption by the state of the responsibility for the deportation of these non-residents as it has for the non-resident insane.
4. The erection of more infirmary beds at the State Sanatorium to enable the State to adequately care for its share of the migratory problem.

This might involve also a change in the State Sanatorium Law.

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#### WORLD HEALTH STATUS

On the whole, the first half of the fiscal year 1927 was characterized by unusually low death rates in foreign countries from which reports were received. In Germany, for instance, the 1926 urban death rate reached the low level of 10.3 per thousand. It is necessary to emphasize, however, that favorable mortality rates such as these do not prevail throughout the world. No view of the world health conditions is in perspective without proper emphasis on the mortality rates of India and Egypt, which are three times as high as ours, or upon mortality rates of certain cities and areas in Spain, Russia, and South America, which are double those prevailing in northwestern Europe, Great Britain and the United States. In most of the countries having higher mortality rates, however, the year was signalized by unusual freedom from epidemic diseases.

The most serious condition that interfered with the attaining of even lower mortality rates was the epidemic of influenza which affected the greater part of Europe in 1925-26. Slight epidemics of this disease following the increased prevalence in the winter of 1925-26 in the United States and elsewhere, had been reported in widely separated places, including New Zealand, the West Indies and South Rhodesia during June to November, 1926; in Denmark in September and in England in November. In March, 1927, the epidemic was practically at an end. While the cases were generally mild, the wide geographic distribution of the epidemic resulted in a gross mortality in Europe that was estimated by the Health Section of the League of Nations as not less than 100,000 deaths. Influenza was also epidemic in Japan and China, but apparently not in India or in Africa.

Cholera, still the scourge of India, did not greatly diminish there, and appeared with much more than usual prevalence in countries eastward as far as Korea and Manchuria. A severe epidemic occurred in Siam in 1926, reaching its peak in July. In China cholera was present at various periods during the year in most provinces, and epidemic in a number of localities. The most serious epidemic in a port was at Shanghai, where more than 1,200 cases were reported in the international settlement from the latter part of July until the middle of September, 1926.

It is significant that yellow fever was confined to one section of the continent of Africa. Cases were reported on the Gold Coast, Nigeria, Liberia, Senegal, the upper Volta, French Sudan, Togoland, and Dahomey. The

disease was more prevalent on the Gold Coast during the first half of 1927 than for six or more years. With the exception of one case, which occurred at Bahia, Brazil, July 4-10, 1926, the disease was not reported in the Western Hemisphere during the year. This highly satisfactory condition is of the greatest importance to all of the American republics.

While devastating epidemics of typhus fever which swept Russia after the World War have definitely passed, that country and the countries on its western and southern borders still constitute an area in which the disease is epidemic. Some increases in incidence of this disease were also reported on the North African coast, especially in Algeria. The decline of typhus fever incidence in Chile since 1920 continued during the past twelve months. Sporadic cases were reported in Mexico. In the Irish Free State a slight epidemic of 24 cases was reported in April, last. However, there has been no marked spread of the disease from any of its endemic centers in any part of the world during the year 1926-27.

Small pox has markedly decreased in continental Europe. Even in Spain, where the death rate from this disease has been high, a definite improvement has been evident. In England and France, however, a mild type of the disease was more prevalent than in the preceding year. Whether the mild type of the disease will supplant its severe form, or the severe form will spread where neglected vaccination exists, it is impossible to say. The fact remains that smallpox is endemic throughout the world, and indubitable evidence accumulates from countries where vaccination is enforced, that the disease in any of its forms can be prevented by vaccination.

Diphtheria, scarlet fever, measles and whooping cough have not manifested an unusual prevalence during the past year, except a somewhat higher than normal incidence of scarlet fever in Poland, Germany and the Netherlands.

Available statistics of tuberculosis mortality in the larger European cities indicate a decline in the tuberculosis rate in 1926. The decrease in deaths in 1926 and 1925 in a considerable group of widely separated cities in Europe was 7.5 per cent. The decrease in German towns since 1923 has been remarkable, the tuberculosis death rate in 1926 being 99 per 100,000. While increases in the tuberculosis death rate in several Spanish cities, Manila and Bombay were in sharp contrast to this rate, the general trend of the disease is encouraging abroad, as well as in this country.—U. S. Public Health Service.

## THE PREPARATION OF PROSTATIC PATIENTS FOR OPERATION\*

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IF an excuse is necessary for presenting this paper, it is found in the fact that some internists still attempt to relieve the constitutional symptoms produced by hypertrophy of the prostate by massage of the organ.

The constitutional symptoms of hypertrophy of the prostate are not produced directly by the pathological prostate, but by faulty elimination on the part of the kidney. Likewise, the danger of the operation for relief of the condition is not found in the field of operation, but in the effect the operation has on the function of the kidneys.

Removal of the cause has become an axiom in medicine. Students are taught to find the cause of symptoms and to remove it promptly. This does not hold good in the treatment of hypertrophy of the prostate. Here prompt removal of the cause leads to disaster. The constitutional symptoms of the condition must be removed or ameliorated before the cause can safely be removed.

The constitutional symptoms of hypertrophy of the prostate are those of chronic uremia. The condition which we call uremia occurs in two types. One accompanies diseases of the kidneys; the other is the result of faulty kidney action due to back pressure of the urine in the kidney pelvis caused by some pathological condition in the lower urinary tract. Each type occurs in an acute and chronic form.

Acute uremia following kidney diseases is characterized by nausea, vomiting, restless delirium, unconsciousness, and convulsions; the chronic form by headache, nausea, vomiting, variable appetite, disturbances of the heart and respiration, loss of vision, edema of the eyelids and extremities.

The symptoms of chronic uremia following back pressure in the kidney pelvis are loss of weight and strength without apparent cause, disturbances of the digestive tract, dry tongue, increased thirst. These patients are pale and have

the appearance of being worn out. This is the old man who is treated for chronic interstitial nephritis. The acute form is brought on by the sudden removal of the back pressure in the pelvis of the kidney. The patient has no pain of any kind. He is sleepy and if aroused will say that he is tired. His tongue is dry and there is not simply loss of appetite but an aversion to food. Diarrhea may be present. Slight twitching of the muscles may be noticed but convulsions rarely or never occur. Death occurs in six to ten days. These patients simply sleep their way into the next world.

The fact that these two types are so different might lead one to suspect that possibly they are not caused by the same toxic substance. As a matter of fact the toxic substances which cause uremia are not known. Surgeons placed great importance on the high urea-nitrogen content in the blood of prostatic patients. In view of the fact that patients in apparently good health are found to have high urea-nitrogen content in the blood, and that patients have died of uremia, whose blood showed a normal amount of urea-nitrogen, is it not possible that the importance of this finding has been overestimated or at least misunderstood?

In order to understand why residual urine develops, we must have a reasonable knowledge of the physiology of the emptying of the bladder as well as the knowledge of the pathology of its outlet.

Normally, the urethral outlet is the lowest point of the bladder. When the bladder is full it is almost spherical in shape, but as it becomes more or less completely empty, either the top falls in, leaving a concave upper surface, or the posterior wall drops forward, leaving a concave posterior surface. When the prostate hypertrophies, the internal meatus is raised up, or if the posterior wall of the prostatic urethra is lengthened it may be raised and at the same time tip forward. If the internal meatus is raised up and the upper wall of the bladder drops down, it may close the outlet completely

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like a valve. If the posterior wall of the urethra is lengthened, and the meatus tipped forward, pressure of the wall of the bladder comes on the posterior margin of the meatus, firmly closing the urethral opening.

Loss of muscular strength is a factor. The bladder muscle has lost its strength in proportion as the other muscles of the body have lost their suppleness. It is no longer able to contract firmly enough to force the urine to pass even a moderate obstruction. That this weakened bladder is really a factor is demonstrated by a case recently in the University Hospital. This patient was admitted with a diagnosis of acute cystitis. Examination showed that he had a hypertrophied prostate. On catheterization it was found that he had no residual urine. After a few days rest in bed and treatment his cystitis cleared up. He was again catheterized and found to have 100 c.c. of residual urine. It required the stimulation of the acute inflammation of the bladder to produce contraction of sufficient strength to expel the urine.

The development of residual urine is due to four factors:

1. Obstruction.
2. Altered position of the bladder outlet.
3. Valve-like action of the bladder wall on the internal meatus.
4. Muscular weakness of the bladder due to the age of the patient.

Whenever the residual urine in the bladder has reached the amount of 100 c.c. the increased intra-vesicle pressure causes a damming back of the urine in the pelvis of the kidney. How long the kidney can functionate normally against this back pressure we do not know, but sooner or later the pelvis becomes dilated, the pyramids flatten and the calices broaden. This compression on the medullary portion of the kidney throws the urinary tubules which it contains out of their normal position. They no longer eliminate the normal amount of organic waste nor do they resorb the excess amount of water poured out in Bowman's capsule. As the result these patients pass large quantities of low specific gravity urine. After a longer or shorter time, depending on the resistance of the kidney to pressure, symptoms of the chronic uremia slowly make their appearance.

Prostatic patients come to us seeking relief from two sets of symptoms: (1) difficulty of

urination, that is, obstruction; (2) obstruction plus chronic uremia.

The permanent relief or cure of the symptoms of hypertrophied prostate is accomplished by operation only. The obstruction which prevents complete emptying of the bladder must be surgically removed. This is true notwithstanding the reported cures by the use of diathermy, x-ray, etc.

The urine of the man who complains of obstruction only will be found, no matter how much residual he may have, to be normal in amount and specific gravity. His blood chemistry will be normal.

The preparation of this patient for operation is a simple matter. He should be catheterized four or five days, once a day, then twice a day for the same length of time, and should wear a retained catheter for approximately a week. Only occasionally will one of these patients become uremic from emptying his bladder. If he does, it will not be serious. Withdraw the permanent catheter or stop the catheterization and in a few days his uremia will have disappeared and the catheterization can be begun again. The fact that this man's urine is normal in amount and specific gravity is positive proof that his kidneys have not been damaged.

The man with chronic uremia presents a much more serious problem. His general health has been undermined. In cases of long standing he may be almost a physical wreck. That his kidneys have been injured by the back pressure is shown by the large quantity of low specific gravity urine which he passes.

It is safe to empty his bladder once to estimate the amount of residual urine he is carrying but if the bladder is completely emptied daily there will be a progressive increase in his uremia and decrease in the amount of urine passed.

Restoring the back pressure to this man's kidneys by stopping catheterization may or may not relieve the acute symptoms. This will depend upon the amount of injury the kidneys have received. If the damage is slight he may recover but if the medullary portion of the kidney has been badly damaged by the long continued back pressure the uremic symptoms increase and the amount of urine lessens until death occurs in from six to ten days.

When back pressure in the pelvis of a kidney that is still able to excrete normal urine is sud-



denly removed the kidney becomes the seat of a passive congestion which is transitory provided the back pressure in the pelvis of the kidney is promptly restored. When the back pressure is suddenly removed from the pelvis of a kidney whose tissues are so badly compressed that it is no longer able to excrete normal urine, we have in addition to the passive congestion the expansion of the compressed tissue.

The medullary portion of the kidney is compressed so slowly by the increasing back pressure that the urinary tubules which it contains are able to adapt themselves to their new position. Their function is faulty but is sufficient to support life. When the pressure is suddenly removed the expansion of the compressed tissue is so rapid that the tubules cannot adapt themselves to the change and the patient dies of uremia.

The uremic man is prepared for operation by the judicious use of the catheter.

The elements which bring success are time and caution. The bladder should be only partially emptied daily, enough urine withdrawn to relieve but not remove the back pressure in the pelvis of the kidney. The amount of urine withdrawn is gradually increased until the bladder

can be completely emptied. This allows the compressed kidney tissue to expand slowly. The urinary tubules not only retain but increase their function.

Under this treatment the uremia slowly disappears. The amount of urine excreted is reduced and its specific gravity increases. How near the urine will return to normal amount and specific gravity depends on the amount of permanent damage the kidney tissue has sustained.

The length of time required to decompress the kidney depends on the physical condition of the patient and the judgment of the surgeon. After it has been proven that it is safe to empty the bladder daily, the patient should be catheterized twice a day. Later, depending on the judgment of the surgeon, a permanent catheter should be inserted.

As far as the danger of uremia is concerned any patient whose bladder has been drained by a permanent catheter for ten days without increasing his uremic symptoms can be safely operated.

In our opinion it is wise to let the uremic patient make a long preoperative convalescence. It is better to use the catheter a month too long than to operate five minutes too early.

## CARDIAC NEUROSIS\*

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CARDIAC neurosis is an extremely interesting and important phase of medicine and one that often does not sufficiently arouse the interest and compassion of the medical profession. The physician's failure to meet the problems of these patients properly has done much to encourage the various irregular healing cults to which many patients drift in their journey, seeking relief. During the years of the World War medical literature teemed with articles dealing with "neurocirculatory asthenia," "soldier's heart," "effort syndrome," and many other descriptive terms which brought to the attention of the medical profession functional disturbances of the heart. These states, like other war-time conditions, are now apparently considered passé, since so little attention is accorded them in civil practice.

The mechanism responsible for the precipitation of cardiac neurosis exists in everyone and its occurrence or non-occurrence is fundamentally a psychologic consideration. From early childhood the human mind is indelibly impressed by certain things regarding the heart. Every child knows that the continuance of life is dependent on the beating of the heart. As the child's age advances, these early and vivid impressions are carefully nursed by the universally accepted phrases of the world's brilliant poets, authors, orators and other intellectual celebrities, who, in moments of emotional outburst, refer to the heart as the seat of love, as the seat of the soul, as the seat of generosity, and so forth. It is almost impossible to read modern fiction or to witness a theatrical production, legitimate or otherwise, that does not metaphorize despair or unhappiness by allusions to the broken heart. These are but a few examples of what the art of synthetic emotionalism does in vividly bringing the heart to the attention of many persons.

Although in most individuals the heart is profoundly affected by emotional influences, the effect is usually so evanescent that no memory of it

is maintained. Emotions, such as fear, anger, expectation and love, are capable of accelerating the action of the heart and render the person conscious of the beating of the heart. The normal status is, of course, complete lack of consciousness of heart activity. However, under emotional stress or unaccustomed physical activity, cardiac consciousness occurs but with most persons no memory is retained. Proof of this is found by asking them when they were last aware of the beating of their hearts and the invariable answer is, "I do not remember."

In a review of the history of the human race it is interesting to note that the strongest of all emotions, fear, has dominated the life of man from the earliest ages and continues to be a potent influence in present-day civilization. Primitive man's existence was a constant conflict with the elements and with the many hazards of his environment, giving rise to and fostering his dominant emotion, fear. Many of our most accepted institutions find their existence in man's attempt to overcome some fear, or, in other words, where man may seek and often find protection. The history of religion is a typical example of this, embodying many forms and variations, yet each and all created to give protection, comfort and assurance.

With all of these facts in mind, it is not difficult to visualize the stage on which may be enacted the drama of cardiac neurosis. The caste comprises individuals in all walks of life and of all degrees of intellectual attainment.

Heredity is an important influence in propagating individuals whose temperament and psychic reactions are such that the development of neurosis is relatively simple. Undesirable traits and characteristics are unfortunately as frequently transmitted to progeny as are the sterling qualities that embody the eugenic ideal. The constant example that many children grow up with, that is, a parent of poor nervous stability who gives vent to emotional outbursts in meeting the usual problems of life, may do much in blazing the trail for their own lack of poise in later years.

\*From the Section on Cardiology, Mayo Clinic, Rochester, Minnesota. Read before the Northern Minnesota Medical Association, St. Cloud, Minn., Sept. 12, 1927.

Let us take for example a rather common series of events leading to the development of cardiac neurosis. Let us assume that the person in question has been under rather unusual nervous strain for a time and the result is a deficiency of nervous reserve. It is well known that when a person becomes nervously exhausted, his sense of proportion and his fineness of judgment often become distorted, particularly in matters dealing with his innermost self. His mind becomes dominated by uncertainties, he loses his sense of decisiveness, and soon an attitude of introspection commands his psychic mechanism. Some rather commonplace event may occur which may involve physical effort, such as a walk uphill, or it may be something suddenly startling, and instantly he is aware of rather rapid and heavy beating of the heart. The mental impression of this occurrence may be slight and quickly forgotten if not repeated. However, if, during the succeeding days or weeks, the heart consciousness is recurrent, a vivid mental impression may be created and the person is ruthlessly thrust among a variety of emotions, in which uncertainty dominates. In view of the fact that never before has he been subjected to such persistent and repeated cardiac discomfort, he becomes convinced that some serious disease has involved the heart. A vicious cycle becomes established consisting of a vivid mental impression, fallacious yet glaringly real, which further contributes to the fatigue of the nervous system. The resulting nervous exhaustion, brought about by uncertainty, worry, introspection, and so forth, is capable of increasing cardiac irritability, and diminishing materially the threshold at which palpitation, tachycardia and the associated symptoms of cardiac neurosis become evident. The recurrence and the persistence of these symptoms, in turn, magnify the mental impression of heart disease. The continuance of these abnormal reactions may finally lead to total invalidism.

The presence of premature contractions or extrasystoles is frequently the result of neurogenic influences. They are as common in normal hearts as in those invaded by disease. Any factor capable of increasing the irritability of the myocardium may give rise to premature contractions. The cardiac consciousness and the associated uncertainty and fear resulting from

premature contractions frequently lead to the establishment of frank cardiac neurosis.

Many cases of paroxysmal tachycardia likewise are neurogenic in origin and may intermittently disturb the patient for the greater part of his life. The fear attending the seizures and the anxiety and solicitation of relatives are often important factors in superimposing cardiac neurosis, with the result that the attacks may be greatly increased in frequency and severity. Paroxysmal nodal tachycardia is the type which is most frequently neurogenic. I have never observed paroxysmal auricular fibrillation, auricular flutter or ventricular tachycardia in hearts not involved by disease.

It is the duty of every physician irrevocably to settle the problem of the presence or absence of organic cardiac disease as soon as possible after the patient has consulted him. In many cases, the physician is responsible for the patient's development of cardiac neurosis. Often months and years of futile invalidism and mental anguish have resulted from medical error or uncertainty. Careful medical appraisal of the body as a whole, painstaking inquiry into the patient's life story, habits, and so forth, in conjunction with the necessary laboratory adjuncts, should settle the question. Several examinations are sometimes necessary, but the period of observation should not be protracted. I do not agree with those clinicians who still refuse to accept neurosis as a clinical entity. There are those who say that the various functional disturbances are the manifestations of concealed pathologic processes, and that examination has failed to reveal the real trouble. Nothing can be more harmful to the patient than such an attitude on the part of the physician. A number of years ago the great panacea for the cure of neurosis was the correction of uterine malpositions, then came the glorious era of the ptoses, then that of concealed tuberculosis, later the romantic field of endocrinology, and, recently, focal infection. I do not wish to appear to be iconoclastic, but I do believe that we, as physicians, must retain our judgment, maintain our perspective of medicine as a whole and not strain the confidence of our patients to the breaking point. We must not promise them miraculous cures from procedures whose bearing on the actual condition is extremely remote.

Many patients, through lack of medical judgment and confidence, run the gamut of quackery, striving futilely to reach the end of the rainbow, and after months or years of this misguided endeavor are at their starting point.

Most patients suffering from serious or advanced heart disease are not neurotic. It is often extremely difficult to obtain their complete cooperation in the maintenance of the necessary cardiac regimen because of their attitude of indifference to the hazards which they are willing to accept.

Occasionally, however, patients are afflicted with heart disease, who have developed well marked cardiac neurosis. They often suffer more from the superimposed neurosis than they do from the existing cardiac disease. This, in my experience, has been most frequent in cases of compensated mitral stenosis.

In some instances, it is difficult to prevent this dual derangement. It is necessary to inform the patients frankly of their cardiac lesion in order to obtain their cooperation in adhering to the restrictions which it may be necessary to impose. A free discussion, and warning them of the dangers of fear and introspection with their resulting penalties, will often abolish such tendencies. A definite change in life's philosophy is an absolutely necessary accomplishment for sufferers with heart disease in order to avert psychic and emotional disturbances. The realization that certain restrictions are imposed to modify their manner of living frequently fosters a more or less constant conflict of emotions. These patients must be made to understand that certain sacrifices on their part are necessary in order to attain a maximal expectation of life and that the sacrifices must either involve the material things in life or life itself.

The management of patients suffering from cardiac neurosis is often difficult and requires time and patience. This is possibly the reason why some practitioners are reluctant to assume responsibility in such cases.

The first attempt of the physician after the establishment of the diagnosis is to impart to the patient the real nature of the derangement. It is not sufficient to tell the patient that there is nothing wrong with the heart or that he is simply nervous. The subjective cardiac discomforts that he has experienced enormously outweigh such bland statements of fact. In most instances in which there is a full discussion with the patient and some relative of the reactions involved in the production of the neurosis, in terms that the layman fully understands, much benefit results. When the patient's level of intelligence is low, much difficulty is encountered in convincing him of the facts.

Cautious and sympathetic inquiry frequently discloses facts pertaining to the patient's life that have an important bearing on his condition. Not infrequently these problems can be eliminated, and complete recovery will result.

The other factors in the management of these patients are symptomatic. At times the careful use of bromide is helpful, but medication must be given with caution for so many patients place all their faith in a bottle of medicine, thereby defeating the fundamental principle of their treatment.

In some cases in which premature contractions are numerous and disturb the patient greatly, the use of quinidin proves helpful. This is also true in some cases of paroxysmal tachycardia, in which continued administration of the drug in appropriate dosage diminishes the frequency and the severity of the attacks and occasionally controls them entirely.

#### MAGIC MATERIA MEDICA

This is put on the market by one C. E. Krueger. He claims to be a chemist and states that, so far, he has "not been able to learn what this healing substance is," but emphasizes that his preparation contains just enough radium to be effective. Mr. Krueger has high and lofty ideas regarding its therapeutic value. He claims that Magic Materia Medica has "cured cataract," is "an excellent eye wash," is good for catarrh and hay-fever, and to have cured rheumatism,

neuralgia, lumbago, eczema, diphtheria, pleurisy, goiter, boils, pimples, stomach, intestinal and kidney trouble, and is even claimed to cure cancer. The A. M. A. Chemical Laboratory reports that from analysis it is concluded that "Magic Materia Medica" is essentially a 10 per cent solution of a mixture of approximately equal weights of anhydrous calcium nitrate and anhydrous calcium chloride, plus a very small amount of sodium iodide. (Jour. A. M. A., December 3, 1927, p. 1983.)



## MALARIA TREATMENT OF PARESIS\*

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TEN years ago Wagner-Jauregg induced artificially a malaria infection in nine patients suffering from general paresis. He had previously observed clinical improvement in paretics who had undergone acute infectious disease. Today, of these nine, three are living and well, five have died, and one remains stationary, clinically arrested.

In 1919 a series of twenty-five cases were treated by induced malaria by this Viennese psychiatrist<sup>20</sup> with a similar result; last summer his series of cases so treated numbered over a thousand. And today the literature contains reports of the Wagner-Jauregg treatment from most corners of the earth. Favorable results, hitherto regarded only as visionary, are more and more emphasized in the later reports. It is fair to estimate that the number of cases treated by now totals about five thousand.

Two years ago I submitted a preliminary report<sup>1</sup> on twenty-three cases of paresis treated by induced malaria infection. In 1924 the first inoculation was attempted at the Minneapolis General Hospital. However, successful inoculation was not possible until early in 1925. During that year fourteen cases of institutional paresis, many in the advanced stages, and fourteen non-institutional cases were inoculated. At the time of the preliminary report, six of the ten cases belonging to the latter series were then up and about, getting along quite well. Two had made no improvement at all and the remaining two had made slight improvement. Speech disorders, tremors, and mental symptoms were favorably influenced to a striking degree. Gain in weight was the rule, beginning in the second week following the cessation of malarial paroxysms, in cases showing clinical improvement.

*The total number of paretics inoculated: 35*

Series (a) 14—institutional cases treated two years ago

Series (b) 14—non-institutional cases treated two years ago

Series (c) 7—non-institutional cases treated less than two years ago

### Tabulation of clinical results

	Full remis- sion	Par- tial remis- sion	Ar- rested	Pro- gressing unfavor- ably	Malaria deaths	Died later
(a)	1	2	3	2	2	4
(b)	9	0	3	0	1	1
(c)	2	2	1	0	1	1

Of twenty-one cases inoculated outside of the state hospital, that is, cases treated in comparatively early stages, eleven are well today (52 per cent).

Of the fourteen cases of that group treated approximately two years ago, nine (64 per cent) are well today, three are clinically arrested and discharged from the hospital, one remains in the hospital and one died the year after inoculation.

Weygandt<sup>2</sup> reported 53 per cent remission in a group of some three hundred cases, after intervals ranging from one to three years. The von Jauregg<sup>3</sup> clinic found that a series of four hundred cases followed up in from two to seven and a quarter years presented 33 per cent full remissions and 14.5 per cent partial remissions.

I will discuss particularly the following: (a) the diagnosis of paresis; (b) the principles of malaria therapy; (c) necropsy findings in brains of patients treated by malaria inoculation; (d) serology.

### THE DIAGNOSIS

In order that a therapeutic report may have merit, it is obvious that first of all the disease treated must be correctly diagnosed. We are forced to admit that the diagnosis of paresis in a small percentage of cases cannot be made without reservation.

Lewis, Hubbard and Dyer<sup>4</sup> followed up one thousand five hundred and fifty-eight cases of paresis. One thousand one hundred and ninety-eight, or 77 per cent, died in the hospital. Eighty-eight per cent lived less than three years. Five and one-half per cent lived longer than five years. One is inclined to suspect that the small percentage outliving the usual expectancy may include doubtful cases. Schmidt-Kraepelin<sup>5</sup> found 6.8 per cent of cases in a series of some

\*Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30 to July 2, 1927.

two thousand cases to have shown a protracted course longer than six years.

Winkelman and Wilson<sup>6</sup> recently reviewed clinical and necropsy records of sixty-seven cases. They concluded that untreated cases of general paresis will show blood and spinal fluid evidences of syphilis; that a certain limited number of cases with mental symptoms and blood and spinal fluid evidences of a paretic nature may at necropsy prove not to be paresis; that a brain which shows a gross organic condition, such as hemorrhage, thrombosis, or gumma, rarely shows microscopic evidence of paresis; and strong laboratory evidences of syphilis without symptoms are not enough to allow the diagnosis of incipient general paresis. We know that the so-called paretic gold curve may be obtained in cases of neurosyphilis other than paresis, and also in multiple sclerosis, meningitis—especially the tuberculous type—in epidemic encephalitis and sometimes in brain tumors. Prodromata of irritability present in some cases as long as three or four years prior to the outbreak of acute symptoms, tendency to a feeling of weakness, and loss in weight, are in my experience strongly in favor of general paresis. It is safe to say that 5 per cent of cases diagnosed as paresis, though arrived at after careful study, may be justly regarded as doubtful cases. It is extremely important to make a differential diagnosis in neurosyphilis because of the bearing on prognosis and treatment.

#### PRINCIPLES OF NON-SPECIFIC THERAPY

There is still much difference of opinion regarding the essential factors involved in the therapeutic action of malaria. More favorable clinical results are shown to occur in my series as well as in many others, when the number of chills and height of fever curve approached the maximum. Post-mortem findings reveal too that spirochetes are practically never demonstrable when the temperature exceeds one hundred and five degrees Fahrenheit. Weichbrodt and Jahnel<sup>7</sup> have shown that by subjecting a rabbit infected with syphilis to a temperature of 107.6 degrees to 111 degrees Fahrenheit for an hour for at least three successive days, all spirochetes lose their viability. Schamberg and Rule<sup>8</sup> recently reported that heating a spirochete suspension for one hour at one hundred and four degrees Fahrenheit rendered it non-infective. The thermal

death point *extra vitam* is regarded by them to be 105.8 degrees Fahrenheit. By means of a hot bath, infected rabbits were induced to undergo temperature rises of four degrees Fahrenheit for twenty minutes, repeated for a number of days. The spirochetes lost their infectivity.

Broken down plasmodia and consequent throwing into the blood of foreign albumins with each paroxysm produces a specific effect according to Plehn.<sup>9</sup> The increased permeability of small blood vessels is the important mechanism according to Bratz and Schultz.<sup>10</sup> Mühlens and Kirschbaum<sup>11</sup> maintain that non-specific stimulation of the defensive mechanism follows destruction of red blood cells and consequent regeneration of them.

Purves-Stewart<sup>12</sup> explains therapeutic influence by the theory that pyrexia burns up the toxins attacking the cerebral cells.

Forster<sup>13</sup> succeeded in demonstrating the presence of spirochetes in three brains of cases in which fever did not exceed 105 degrees Fahrenheit.

Schumacher<sup>14</sup> maintains that in malaria therapy extensive destruction of red blood cells results in the development of autogenous lipid-albumin compounds which, in a bio-chemical sense, possess specific spirillicidal properties.

Perhaps it may not be long before we may be able to dispense with malaria inoculation and yet obtain no less favorable clinical results. And is it too much to hope that by combining induction of fever methods, external heat and internal foreign lipoprotein administration at the same time, syphilitic infection may be terminated promptly and effectively in all stages?

#### NECROPSY FINDINGS IN CASES TREATED BY MALARIA

Coming to the later chapters on the chronology of malaria treatment of paresis, we have the interesting one referring to the histological changes in the brains of patients treated, and dying of various causes. Sträussler and Koskinas<sup>15</sup> reported their studies of thirty-eight cases. They believe that the clinical remissions occurred simultaneously with recession of the anatomic changes. Many of these patients died within several months following treatment. Patients living longer than six months gave but scant evidence of a former paretic process in the brain. Only slight subependymal and meningeal thicken-

ing and increase in the nuclei of the zonal area could be detected.

Frets<sup>16</sup> examined ten brains of treated cases. These all presented variations from those not treated by malaria. The microscope confirms that anatomic benefit may parallel clinical and serologic improvement. Some special features of the general parietic cortex still persisted, although much less pronounced.

Freeman<sup>17</sup> says:

"Therapeutic malaria is followed rapidly by organization of the inflammatory exudate in the meninges and about the blood vessels. During the following months the exudates are resorbed and the glia and vascular tissue regress to a great degree. Finally, the cortical architecture is reconstructed by resumed cellular polarity and restored lamination and perhaps by thickening of the cortex. The ganglion cells of the cortex are more or less reduced in number. Fibrous glia beneath the pia and ependyma changes little. Spirochetes are not found.

"On the basis of fifteen cases of general paralysis treated by malaria in which the patients died later, it may be prophesied that eventually the term recovery will come to be used for certain cases instead of remission. Except for some reduction in the number of neurons in the cerebral cortex and marginal fibrillar gliosis, the anatomic picture practically does not deviate from the normal, and the brain is evidently in satisfactory working condition, to judge from histologic appearances. The necessity for early treatment is indicated by complete anatomic arrest without clinical improvement in a case of four years' duration before treatment."

disappearance of the inflammatory and degenerative lesions, but also considerable repair of the cortex. In the eight cases dying within a few weeks after the first chill, intensification of the pathologic process could be demonstrated.

Hassin and Bassoe<sup>18</sup> state that cure of general paralysis with modern methods—tryparsamide or malaria—cannot be expected. This is representative of the attitude of caution with which the question of curability of this malignant disease has been regarded.

Necropsy studies reported in the literature suggest grounds for an attitude of hope with regard to the question of the curability of paresis. Nevertheless, the evidences are not adequately convincing. We must look for more extensive neuropathologic research before this question can be regarded as more satisfactorily settled.

#### SEROLOGY IN MALARIA TREATED CASES

If histopathologic studies indicate a favorable course in the brain, taking place at or nearly the same time that clinical recovery occurs, what can we say about the blood and spinal fluid reactions? So far we have been able to check on the serological findings in but three extra-institutional cases treated two years ago.

Ferraro and Fang,<sup>19</sup> among others, have recently reviewed the literature referring to the effect of malaria treatment upon the cell and glob-

Case	Blood Wass.	Spinal fluid Wass.	Nonne	Cells	Colloidal Gold
BA {4/16/25	+	+	±	10	555555400 (Before inoculation)
{5/ 3/27	neg.	neg.	+1	1	0012231111 (After inoculation)
MG {8/31/25	+	+	+2	38	555432000 (Before inoculation)
{6/ 8/27	neg.	+	+2	27	2555554221 (After inoculation)
NP {5/ 3/25	neg.	+	+1	30	555554300 (Before inoculation)
{8/ 8/27	neg.	—	?	2	000000000 (After inoculation)

Freeman prophesies that the term recovery will come to be used for certain cases instead of remission. He emphasizes that the necessity for early treatment is particularly indicated on anatomic grounds. In his fifteen brains no spirochetes could be found. In two cases where treatment had failed completely the pathologic process seemed uninfluenced. One patient dying four months after malaria showed almost complete arrest of the paralytic process; the four others who had lived ten, seventeen, eighteen and nineteen months presented not only complete

ulin reaction and upon the blood and spinal fluid Wassermann, and the colloidal gold curve. They find that serological improvement gradually increases from 15 per cent of the cases within six months after treatment by malaria to 85 per cent examined thirty-six months after the inoculation. Fifty per cent of the spinal fluid specimens show a complete reversal to the normal number of cells two years after treatment; globulin reaction improved gradually, but was less pronounced; Wassermann reaction was completely negative thirty-six months following

inoculation in 68 per cent of cases; colloidal gold reaction persisted most and after two years began to flatten out in my cases. In thirty-six months 85.5 per cent of fluids show improvement and a few complete reversal to the normal. The blood Wassermann at the end of a six months interval was negative in 28 per cent of cases; at the end of three years 86 per cent were negative.

From all this it seems fair to conclude that the irreversibility of the serological reactions in general paresis, held until very recently to have never been really proven, can now be claimed as an actual occurrence.

The malaria treatment of paresis involves the consideration of many problems. Inasmuch as induced tertian malaria occasionally causes death, it is no doubt prudent to limit its application to patients suffering from a syphilitic disease that is lethal if untreated. That disease is paresis. The choice of the malaria treatment may still be regarded as based on empirical foundations. The observations of continued improvement and apparent recovery from paresis have indeed been striking; the attitude of skepticism so often hitherto assumed with regard to the malaria treatment seems, in retrospect, now quite extraordinary. Excepting probably trypanamide, no form of specific chemotherapy has yielded clearly convincing results in prolonging the life of the paretic patient. The Wagner-Jauregg malaria treatment signifies an epoch-making achievement in the therapeutic annals of the field of mental diseases.

#### SUMMARY

The clinical results obtained by treating thirty-five paretic patients with induced malaria are recorded. Fourteen cases were of the advanced institutional type; twenty-one were in less advanced stages of the disease. The diagnosis of paresis, principles of malaria therapy, necropsy findings and serology of treated cases are discussed. Patients in the advanced stages of the disease were less favorably influenced than the series of patients in the relatively less advanced stages of the paretic disease. This latter series presented, after two years and more, a remission rate of 64 per cent.

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## PRESIDENT'S PAGE

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*Minneapolis*

**F**ELLOW members of the State Medical Association:

With the many demands of modern society on the pocket-book of the doctor, we are all anxious to keep down expenditures. From personal experience and from my observation, however, it seems to me that the majority of us are more interested in what we are getting for our money than what we are spending.

With this in mind I will briefly outline the budget of the Association for the coming year as determined by the advisory council in an attempt to show what the individual member of this Association is actually getting for his money.

Of the \$15.00 each member pays for 1928, \$2.00 goes to MINNESOTA MEDICINE; \$0.50 for legal expenditure; \$1.50 for the Education Fund; \$3.50 for the Public Health Education Committee; \$0.12 for the Health and Hospital Educational Committee; \$4.16 for administration; \$0.60 for the expense of the annual meeting; the remaining \$2.62 is the reserve for emergency expenditures.

Most of these items I feel are self-explanatory. The three large items which absorb most of the dues are first: \$4.16 for administration. This takes care of the salary of the part time executive secretary and the expense involved in the administration of his office. The office of part time secretary was established in 1924.

The secretary is essentially the business manager of the Association. He takes care of all the secretarial work of the council and the various committees. He makes personal visits to the societies that are inactive, and helps to stimulate them to activity and to maintain a higher standard. He has charge of the bulletins and keeps a complete card index of every physician in Minnesota, both those who are members of the State Association and those who are not. These records are kept up to date and they are sent monthly to the American Medical Association. He keeps a complete tabulation of the physicians in good standing and those who are not. He knows when they were licensed, what

school they graduated from, the date of graduation and their present location.

Although the medical defence has been discontinued there are still some cases pending. The secretary's duty is to follow up and keep records of such cases.

He attends to the collecting of dues, membership, etc., although he has nothing to do with the funds of the Association which are in the hands of the Finance Committee of the council. He acts as a liaison officer between the press and the laity. He makes all arrangements for the annual meeting, coöperating with the local committees to insure proper accommodations and meeting places. He coöperates with the Legislative committee and attends meetings. During the legislative session, he attends the meetings, making reports, etc. We have at present an unusually efficient secretary in Dr. E. A. Meyerding. I think we are getting more than our money's worth.

The second item of importance is \$3.50 from each member for the Public Health Education Committee, which is headed by Dr. George Earl. Few of the members of the Association appreciate the amount of work Dr. Earl has done on this committee. He has met with groups of physicians throughout the State in conjunction with the secretary, attempting to crystallize the ideas of the profession on medical publicity. This committee contemplates sending out weekly bulletins on scientific medicine in the State. Its plans provide for a speakers' bureau for lay meetings. This committee is attempting to work with the various lay health organizations in furnishing them the proper propaganda from the standpoint of the doctor. We are behind many other States in this work, and we may expect of this committee work which will lead to a finer coöperation of the public and more confidence in the high ideals of the medical profession.

The third item is \$2.62 placed in the reserve fund for emergency expenditures. It is only the part of a wise individual or group to lay up something for a rainy day. We were led to be-

lieve that there would be an attempt made to test the constitutionality of the Basic Science Law. This has not yet materialized, but may when enforcement is started. Furthermore, it will be necessary to maintain a substantial fund and an alert organization to prevent attempts against this act. Is it not the part of wisdom to have something to fall back on for an emergency of this kind?

Figures show that since the establishing of the part time secretary, physicians throughout the State regard membership in this Association as a great necessity. The American Medical Association Directory for 1925 gave the total number of physicians in Minnesota as 2,842. At that time there was a total membership in the Association of 2,010. In 1927 the total number was 2,982

and the membership was 2,026. Thus, in spite of the fact that the annual dues have been increased there has been a growth in membership. This we believe indicates an actively growing and more efficient organization.

Every member of the State Association must feel justly proud of his Association. Compare it, for instance, with a State like Indiana, with 4,162 licensed physicians, and only 2,774 members in the State Medical Association.

In conclusion, I can assure you that the men elected by you to carry on the business affairs of the State Association consider the handling of its funds a very great responsibility. They are trying their best to give something worth while for every cent invested. They ask of you, in return, your whole-hearted coöperation.

# MINNESOTA MEDICINE

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ASSOCIATION, NORTHERN MINNESOTA MEDICAL  
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## EDITORIAL

### **Humor**

Humor is often more of a corrective than stern criticism. Will Rogers has established a reputation as one of our leading humorists. In his recent articles entitled "Hole in One" which appeared in the Saturday Evening Post (November 5 and 12) he describes in a humorous way his recent gallbladder operation. One must be a true humorist to see anything funny in such an operation even when it is over—that is, if he actually had one. But what an opportunity to give some digs at the medical profession. These articles doubtless have been greatly enjoyed by members of the profession even though they are the butts of his remarks. How often the medical history and physical findings are made to fit

a preconceived diagnosis! And how likely the so-called diagnostician (and every specialist as well as general practitioner should be a real one) proves to be only a sign-post or overdoes the laboratory procedures and becomes a test-doctor. Too often the doctor is judged by the kind of a car he drives.

The humorist has a definite mission in life and the more real humor of the kind that doesn't hurt, but points out weaknesses—the more, we say, the better.

### **The Clinical Laboratory**

The need for specialization in medical laboratory procedures was the natural outgrowth of the recent rapid development of clinical laboratory methods. Medically trained individuals have taken up the specialty. The laboratory technician, less highly trained, and as a rule without a medical degree, followed. Laboratories, backed entirely by non-medical individuals and manned by technicians, have made their appearance, and financial considerations too often have overshadowed the scientific or medical side of the undertaking. Some such laboratories have been established as training schools for technicians, which from the start were doomed to failure because of their inability to obtain laboratory material with which to train technicians. High pressure business methods and even misrepresentations in order to obtain students have been resorted to. Technicians backed by a loan and an M.D., with no laboratory training, have entered the field.

The value of the standardization of clinical laboratories through the adoption of minimal requirements and the insistence of trained medical supervision seems apparent. The Council on Medical Education and Hospitals of the American Medical Association is doing an important service in the interests of the profession by insisting that clinical laboratories be operated under the supervision of medically trained individuals. The profession should be willing to do its share both individually and collectively by patronizing only such laboratories as are approved by the Council.

The following statement by the Council explains the present status of this particular phase of its work.

## CLINICAL LABORATORY SERVICE IN THE UNITED STATES

Statement by the  
Council on Medical Education and Hospitals

During the last decade there has been much discussion in medical and laboratory journals, and particularly on the platform of medical and laboratory conventions, regarding the status of the clinical laboratories of the country. Especially it was regretted that the practice of clinical pathology, regarded as one of the medical specialties, had fallen into disrepute. The fact was lamented that the laboratory work had fallen into the hands of lay technicians and become the toy of persons who had a purely commercial point of view and very little training for the work. Much disgust and quite a strong note of despair was sounded by those few members of the medical profession who had championed the cause of clinical pathology and had adopted that specialty as a life work.

Many letters were received at the office of the American Medical Association from practitioners of pathology and leaders in medicine, regretting the drift toward lay commercialism, and urging that something be done to counteract it. What to do about it was a question. Organizations of chemists were interested because some of their members ran laboratories. Likewise organizations of clinical pathologists, bacteriologists, and of the medical profession were equally interested. Some of these organizations working alone undertook to investigate and to standardize the practice of clinical pathology, hoping to check the drift of that practice into the hands of technicians and restore it to its rightful place as a medical specialty. The efforts of those organizations working single handed were of little or no avail except to emphasize the enormity of the task and the necessity for coöperation.

### COOPERATION EFFECTED IN 1923

The necessary coöperation of the laboratory and medical organizations was brought about in 1923 at the annual meeting of the American Medical Association in San Francisco. At that time, delegates sent by the American Chemical Society and the American Association of Pathologists and Bacteriologists separately petitioned the American Medical Association to establish some supervision over clinical laboratories. This led to the appointment of three committees representing the American Chemical Society, the American Association of Pathologists and Bacteriologists, and the Council on Medical Education and Hospitals. At a joint meeting of these committees in Chicago early in 1924, after much deliberation, certain basic principles underlying sound laboratory service were agreed upon which stressed specially a qualified bona fide director as the prime essential. The joint committee agreed that the work could best be conducted by the Council on Medical Education and Hospitals.

The first steps were: (a) to secure a complete list of laboratories in the country; (b) the preparation of a schedule of essentials in an approved clinical laboratory, and (c) the preparation of a questionnaire by

which the essential facts regarding each laboratory could be obtained. Each of these measures was carried out with the advice and coöperation of fifty or more clinicians and others expert in laboratory work, including the committeemen of the above-named organizations, and by the officers of the American Society of Clinical Pathologists, which very early showed an interest and from which the Council has received a hearty coöperation.

After being revised and adopted by all parties interested, the questionnaire was mailed to all the laboratories of the country and a most hearty response was received. A complete report of the survey, "Essentials of an Approved Clinical Laboratory," and a preliminary list of laboratories which appeared to be fully complying with those "Essentials," were published in the Hospital Number of the Journal for April 3, 1926. The facts as published were submitted to the House of Delegates of the American Medical Association at the Dallas session in 1926 and approved by that body.

To assist in giving as fair consideration as possible to each application for approval, a strong committee of laboratory experts was formed in every state or section of the country. Those committees aggregate one hundred and twenty individuals representing, as equally as possible, the coöperating organizations and hence the interests of the laboratory profession. Under the direction of the Council, each committeeman makes his investigation and renders his report or advice independently of other committeemen in the same district.

At the present time, of the three hundred and fourteen laboratories that have reported, one hundred and fifty-one, after careful investigation, have been placed on the approved list and other applications for approval are constantly being received.

The Council lends all possible assistance to laboratories whereby they may become eligible for admission to the accepted list. Every laboratory that makes a report and signifies a desire to conform to the requirements, is informed in regard to any deficiencies. The spirit of this movement all the way through is constructive. Anyone who knows the condition of the laboratory field at the time this survey was begun, would not expect very telling or spectacular results to be shown by this time; nevertheless, there are ample reasons for believing that actual improvements are being made: (1) a number of laboratories formerly run by technicians and only nominally under "medical" directors, have come under the ownership and actual control of clinical pathologists of high professional standing and ripe experience; (2) a number of laboratories under the control of technicians have gone out of business; (3) the "Essentials" have been published repeatedly and thus brought to the attention of all persons working in the field of clinical pathology; (4) there is an increased demand for pathologists to man the clinical laboratories of the country; (5) the director of the Mayo Foundation says that the salaries offered the pathological graduates of the Foundation are double those offered to other graduates of the Foundation; (6) the feeling of unsteadiness indicated in the



discussions of a few years ago has subsided to a considerable degree, and there is a more hopeful attitude on the part of the clinical pathologists themselves.

#### FUTURE OUTLOOK

The movement is still in its beginning, but a good start has been made. To what extent doctors have actually discontinued sending specimens to unapproved laboratories and are sending them to approved laboratories is not known. The educational results, however, are becoming increasingly evident. In order to secure the best analyses for the benefit of their patients as well as to best conserve the interests of the medical profession, physicians should refuse to have their work done at laboratories conducted under the direction of non-medical individuals. Much depends, also, on the continued hearty support of the various organizations and individuals who operate in the laboratory field. That this is already assured is indicated by the promptness with which laboratories are filling out and returning the form that has recently been mailed out by the Council on Medical Education and Hospitals for a complete and needed resurvey of laboratory service. The resulting data from this survey will be published for the benefit of all. Of course, any laboratories that are not yet on the list will be promptly considered for approval, if they express such a desire.

## MISCELLANEOUS

### CONFERENCE ON PUBLIC HEALTH RELATIONS

At the Conference on Public Health Relations held at the Nicollet Hotel in Minneapolis, Dec. 10, 1927, under the supervision of the Committee on Public Health Education of the State Medical Association, the subject was discussed from various standpoints. The committee, of which Dr. George Earl is chairman, has been devoting itself the past year to discussions in numerous smaller groups of physicians in an effort to crystallize medical opinion as to the best methods which should be employed by the Committee.

The following address comprises in part the remarks made at the conference by Mr. C. W. Jones, General Manager of the Minneapolis Journal, and should be interesting to the profession, as it gives a newspaper's side of the question of medical publicity. It is to be heartily wished that all Minnesota newspapers would adopt the same policy regarding medical advertising and medical news as that adopted by the Minneapolis Journal in the interest of public welfare and the avoidance of sensationalism.

#### THE MEDICAL PROFESSION FROM A NEWSPAPER'S VIEWPOINT C. W. JONES

This meeting is the first occasion that has come to the notice of the Minneapolis Journal in which the medical profession has taken the initiative in an effort to establish more intimate relations with the newspapers of the state or work out anything more than a

temporary arrangement for giving the general public information concerning the promotion of public health.

Usually when the medical profession takes the initiative in this particular matter, an emergency of some sort already exists; and after the emergency has been met, the work of disseminating public health information stops, so far as any consistent effort on the part of the medical profession is concerned. Two demonstrations of the truth of that statement are to be found in the smallpox scare of a few years ago, and in the more recent scarlet fever epidemic. Confronted with an emergency on both those occasions, the medical profession appealed to the newspapers to help give proper information to the public, and in the latter case to encourage use of the inoculation clinics. But after the emergency passed, contact between the medical profession and the newspapers ceased, so far as any initiative on the part of medical men was concerned.

The medical profession has let the newspapers assume the burden of what general public health education is being provided.

The Journal pays Dr. W. A. Evans to write a daily column on health problems, and to answer the questions of its readers. The arrangement was made on the initiative of the newspaper because it felt an obligation to the public to provide some consistent medium of information on medical and health subjects.

The long series of articles on proper and improper methods of reducing, and the dangers of improper reducing, published by the Journal last summer, was arranged, not by the medical profession, but by the initiative of a newspaper. The medical profession, it is true, co-operated generously and effectively in preparing the articles through the American Medical Association; but it is also true that had the Association itself conceived and pushed the same idea as an important public service, those articles might have reached millions more people than they did. Had the preparation and publication of those articles been a public instead of a private enterprise, and handled as well as the private enterprise was handled, virtually every important newspaper in the country would have been glad to publish them.

The same is true of the series of articles on "Why Men Fail," now running in the Sunday Journal. The idea was conceived and pushed by a newspaper, not by the medical profession. The American Medical Association and the American Psychiatric Association co-operated; but the initiative lay with the newspaper, not with the profession which might be expected to be constantly working to put such information before the whole American public.

These statements are made, not in a spirit of criticism, but as reasons for our honest belief that the medical profession has not taken full advantage of the opportunities available to it for increasing the public's knowledge about medical progress and the best methods of preserving health.

There is a similar illustration nearer home. The Minneapolis Journal is more fortunate than most newspapers in its contacts with the medical profession; but

frankness makes it necessary to say that this relationship is the result of a suggestion made by The Journal. In this instance again, the medical profession as represented by the Hennepin County Medical Society cooperated heartily; but the initiative came from the newspaper, not the physicians and surgeons.

Several years ago an interesting and unusual operation was performed in a Minneapolis hospital. The Journal endeavored to obtain the facts concerning it, and finally did so; but in the effort it encountered so many obstacles placed in its way by various doctors and hospital attendants that the city editor made up his mind there was a serious misunderstanding of purposes between the medical profession and the paper. He got in touch with officers of the Hennepin County Medical Society, telling them so far as The Journal could see there was no reason why The Journal could not be of service to them as well as to the public generally, in telling of important and interesting developments in medical science, if a basis of understanding could be reached. Two or three informal conferences were held, between officers and members of the publicity committee of the medical society and representatives of the Journal news department.

I think both parties to those meetings discovered that the physicians had no desire to suppress either important or merely interesting medical information, and that The Journal had no desire to sensationalize any information or to print anything which might be harmful or embarrassing to anyone. Both parties made up their minds that they could work together to mutual advantage and in the public good.

The net result was the decision by the medical society to appoint a committee to cooperate in furnishing information to The Journal. The society selected, in each principal field of medicine and surgery, two members who were authorized by the society to give information to The Journal freely and fully, whenever The Journal requested it. In return, The Journal agreed to consult the proper member of this committee concerning every news article of a medical nature, so that the accuracy of such articles in The Journal could be guaranteed. This arrangement, made some five years ago, is still in force; from the Journal's standpoint, and I think also from that of the Hennepin County Society, it has worked out splendidly. You will find no wild, half-baked stories of wonderful medical discoveries in The Journal; our arrangement with the medical society's committee enables us to choose the true from the false, the valuable from the quack. On the other hand, even with this arrangement, you will find in The Journal no articles on medical progress or discoveries or the promotion of public health that have come to The Journal through the initiative of the medical society. The Journal prints some articles of that nature; but they are articles which The Journal itself either prepares or buys. We would print many more of them if they were available, because we feel that to do so is not only good business, but a public service.

Once more, not in a spirit of criticism, but solely to fulfill the job assigned in Dr. Earl's letter, candor re-

quires the statement that when medical organizations do attempt to prepare information for the public through the newspapers, the work too often is relegated to persons apparently not qualified to do it. The series of articles prepared by the American Medical Association and the American Psychiatric Association demonstrate that medical information can be made interesting and informative at the same time. These two series were intensely interesting because they had been prepared by men who knew two things: their own work and the English language. When medical information is prepared for the public, it presumably has but one purpose—to reach and influence as many people as possible. To reach them and to influence them it must interest them. To interest them it must be prepared by men fired with enthusiasm for their subject and fully informed about it, and at the same time sufficiently skilled in the use of words common to ordinary men and women.

There is no insurmountable obstacle to prevent the Hennepin County Medical Society or the Minnesota State Medical Association from designing and preparing, from time to time, articles or series of articles on timely medical or health topics. There is no reason why, if the articles are prepared by the *best* men in the profession, and not left to somebody who has the most time to do the job, such articles could not be made as interesting and as valuable as the recent work of the American Medical Association and the Psychiatric Association.

#### THE NORTHWEST CONFERENCE FOR CHILD HEALTH AND PARENT EDUCATION

The Director and the Officers of *The Northwest Conference for Child Health and Parent Education*, to be held in the City of Saint Paul on March 27th, 28th, and 29th, appreciate the hospitality of the columns of MINNESOTA MEDICINE. They hope that this and future sessions of the Conference will merit the support alike of the medical press and the medical profession.

In the January number of MINNESOTA MEDICINE they issued *The Call to Positive Health*, which is the gathering note of the Conference. It is the call to two distinct phases of public health activity—the preservation of health and the promotion of health. Each of these two constructive measures, the one foundationing the other, applies with greatest force and promises largest fruitfulness in the years of youth. From the very inception to the actual maturity of life, structural growth and elasticity, functional development to its fullest range, reflex and mental reactions to constantly multiplying stimuli—these are the agencies which, intelligently used, promote child betterment. The child develops from within; he builds himself. We—whether directly as parents, or indirectly as physicians, teachers, health workers—simply direct the process. True, our direction is not, as yet, wise enough, does not extend far enough. It demands, for security of results—and long results of time they are—painstaking child study and intimate child understanding. And the understanding must not be confined to the individual

child. It must extend to all his relationships—to the contacts of child with child, of child with parent and parent with child, to the reactions of the child to his environment in the home, the school, the community. All these things make alike for health preservation and health promotion.

Technically speaking, health preservation depends fundamentally upon two safeguards, with the achievement of which the physician is most nearly concerned. It depends upon healthful living and upon the prevention, so far as our present knowledge permits, of disease. In a word, health is to be safeguarded from within and from without.

Does not the conception of child health and of parent education—and may we not add medical education as well—widen with these considerations? It is the child, as a whole—the child in his physical and mental development, in his moral and social habits and behaviors—with whom we have to deal. In a very real sense, in these days, it is a *new* child, born into a *new* world, growing up into a *new* environment, responding to *new* influences, it is this new child whom it is ours to keep well and to make better. This is the large meaning of The Northwest Conference for Child Health and Parent Education. It is the meaning of the call to positive health. Parent Education has to encompass this large meaning. The teachers of intelligent parenthood, in this comprehensive field, are in demand.

Mothers, fathers, teachers, physicians, public health workers, and nurses will find the three days' session of the Conference a rich reward for the effort and cost of attendance.\*

RICHARD OLDING BEARD, M.D.  
Executive Secretary to the Conference

\*For information address the executive secretary, offices of The Saint Paul Association, Fourth and Cedar Streets, Saint Paul, Minn.

## OBITUARY

### Dr. Charles E. Smith

With the death of Dr. Charles E. Smith, Jan. 10, 1928, at the age of 85, the last of the group of first physicians in the state passed away.

Born in the East, Dr. Smith received his M.D. degree at the University of Pennsylvania. He immediately moved to Saint Paul in 1855 with his father, Dr. F. R. Smith. He was city and county physician before there was any city hospital and when Saint Paul consisted of but one graded street.

Dr. Smith practised continuously in Saint Paul until forced to give up active practice by ill health. For a number of years he was associated with the late Dr. E. J. Abbott. His father and grandfather before him were physicians, and his son, the late Dr. Charles E. Smith, Jr., followed in his footsteps.

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### A. M. A. MEETING

Arrangements are being made for the Scientific Exhibit for the Minneapolis Session of the American Medical Association, June 11 to 15, 1928. The Scientific Exhibit will be located in the Minneapolis Auditorium; in this building will also be housed the Registration Bureau, Technical Exhibits, and some of the Sections of the Scientific Assembly.

The Committee on Scientific Exhibit emphasizes that exhibits should be presented in a way which will stress their scientific value. This may be done by carefully worded explanatory placards, but particularly by personal demonstration. (The Committee requires that all booths shall be in charge of a competent demonstrator.) Also it should be remembered that the general attractiveness of the exhibit is essential; the Committee will do its part by having the booths decorated appropriately and will furnish uniform signs giving the name of exhibitor and the title of the exhibit. The total amount of space available in Minneapolis is only slightly larger than that available at the 1927 meeting in Washington. From the interest already manifested in the next Scientific Exhibit, it is evident that large blocks of space cannot be assigned to individual exhibitors.

If you desire to exhibit, an application blank may be secured from the Chairman of the Local Committee on Scientific Exhibit, Dr. William A. O'Brien, University Hospital, Minneapolis, or Paul Nicholas Leech, Director, Scientific Exhibit, 535 North Dearborn St., Chicago, and should be returned as soon as possible. Applications must be received before March 20th. In order that the amount of space available may be apportioned to the best advantage to all concerned, the Committee will make no assignments previous to April 15th.

The Motion Picture Theater, on recommendation of the Board of Trustees, will be omitted at the Minneapolis Session.

### BLUE EARTH COUNTY MEDICAL SOCIETY

At the annual meeting of the Blue Earth County Medical Society held December 19 at the office of the Mankato Clinic, the officers for 1928 were elected as follows: J. T. Schlesselman, M.D., Mankato, president; P. H. O'Connor, M.D., Amboy, vice president; W. C. Stillwell, M.D., Mankato, secretary-treasurer; Wm. Black, M.D., Mankato, delegate; H. J. Lloyd, M.D., Mankato, alternate.

Those elected to the Board of Censors are Drs. T. C. Kelly, Mankato, J. H. James, Mankato, and V. I. Miller, Mankato.

### THE STATE MEDICAL SOCIETY OF WISCONSIN

The State Medical Society of Wisconsin will hold its 1928 meeting in Milwaukee, opening Tuesday evening, September 11, with scientific sessions on Wednesday, Thursday and Friday, September 12, 13 and 14.

## MINNEAPOLIS SURGICAL SOCIETY

The February meeting of the Minneapolis Surgical Society will be held February 2 at the home of Dr. J. Frank Corbett. The program will be:

1. Case Reports
  - a. Sigmoidal Fistula Discharging through the Right Thigh. Dr. C. M. Roan.
  - b. Renal Calculus. Dr. Leo Murphy.
2. Embolectomy, with Report of the Removal of an Embolus from the Brachial Artery. Dr. H. F. Wiese.
3. Intestinal Obstruction Due to a Gallstone. Dr. R. C. Webb.

Election of officers.

The January meeting of the Society was held January 5 at the Minneapolis General Hospital, with the following program:

1. The Treatment of Arteriosclerotic Gangrene. Dr. E. A. Regnier.
2. Operative Treatment of Fractures, Especially of the Humerus. Dr. R. R. Cranmer.

## RED RIVER VALLEY MEDICAL SOCIETY

The annual meeting of the Red River Valley Medical Society was held at the Hotel Crookston, Crookston, Minn., beginning with a dinner at 6:30 p. m., Friday, Dec. 16, 1927. The members of the Ladies Auxiliary also attended. In spite of the severe weather and almost impassable roads, places were laid for 45. After the dinner the ladies adjourned to their own meeting.

As this was the annual business meeting of the society the entire program had been made up of medical economic subjects, as follows:

1. The Doctor and the Law, Senator J. H. Hougen, Crookston.
2. The Problem of Medical Fees:
  - (a) As seen by the doctor, Dr. H. H. Hodson, Crookston.
  - (b) As seen by the collection agency, Mr. C. F. Franz, Crookston.
3. The General Practitioner:
  - (a) In relation to his fellow practitioner and the specialist, Dr. W. H. Henney, McIntosh.
  - (b) In relation to his patients and the community, Dr. J. A. Roy, Red Lake Falls.

These subjects all invoked a liberal discussion, as did the subject of a minimum fee bill, and the matter of liability insurance, which were brought up at the business session.

Prizes for attendance at this meeting, which had been offered by the society, were distributed as follows:

1. To the doctor coming the longest distance: A years subscription to Hygeia, to Dr. C. M. Adkins, Grygla, who had traveled about 82 miles to attend the meeting. Honorable mention should be made of Dr. J. J. Stratte of Hallock, who came nearly 70 miles.
2. To the oldest doctor attending: A copy of the

"New Medical Follies," to Dr. G. S. Wattam, of Warren, who because of his youthful age, in spite of advanced years, always attends meetings regularly.

3. To the most recent doctor's wife: Three years subscription to the Northwestern Health Journal, to Mrs. C. L. Oppegaard, Crookston.

Officers elected for the ensuing year were as follows: President, Dr. J. F. Norman, Crookston; vice president, Dr. H. W. Froehlich, Thief River Falls; secretary-treasurer, Dr. M. O. Oppegaard, Crookston; Delegates, Dr. H. M. Blegen, Warren and Dr. O. E. Locken, Crookston; alternates, Dr. C. L. Oppegaard, Crookston, and Dr. W. H. Henney, McIntosh; censor for three years, Dr. J. A. Roy, Red Lake Falls.

## OF GENERAL INTEREST

Dr. A. J. Wentworth of Mankato attended the annual convention of the Radiological Society of North American at New Orleans the first part of December.

Dr. A. E. Sohmer of Mankato attended the special course in Urology given at the Mayo Clinic, Rochester, in December.

Dr. A. R. Blakey and Dr. E. A. Rygh of Stillwater have recently located at Osakis and Minneapolis, respectively.

Dr. C. A. Ingerson of Saint Paul, coronor of Ramsey County, has been elected a member of the executive council and of the advisory board of the National Association of Coroners.

Dr. A. C. Strachauer, Minneapolis, will give the address in Surgery at the meeting of the Nebraska division of the American College of Surgeons in Omaha, on February 7. His subject will be cancer.

Articles of incorporation have been filed with the secretary of state for the Franklin Public Hospital Association for the purpose of building a new hospital in Minneapolis. The incorporators are Dr. E. K. Green, Dr. John S. Macnie, Dr. Stephen H. Baxter, and Dr. Clarence E. Willcutt.

Dr. Harold S. Diehl, director of the student health service of the University of Minnesota, has been re-elected to the presidency of the American Students' Health Association. Dr. Diehl has just returned from New York, where the association held its annual meeting.

An interesting report concerning the basic science board examinations instituted last June has been made by Dr. E. T. Bell, showing that less than 10 per cent of those appearing for examination have failed to pass. Since the board began functioning 112 candidates have been examined. Of this number 105 have been given passing grades.

Dr. Hobart C. Johnson of Lamberton will leave early this month for London, where he will take a six months' course in the school of tropical medicine and hygiene at the University of London, preparatory to taking up his duties in Tanganyika territory, British East Africa, where he and Mrs. Johnson will act as medical missionaries.



Dr. Ethel Barrow was married to Dr. K. Frater on December 17 in Rochester.

Dr. E. Covell Bayley will locate in Lake City, Minn. and take over the practice of his father, the late Dr. Emery H. Bayley, as soon as he has completed his intern's course at the Jersey City Hospital, New Jersey. Dr. Covell Bayley is a graduate of the University of Minnesota medical department, and has nearly completed two years' of hospital experience.

Dr. Gerald M. Koepcke, who is associated with Doctors F. J. and J. A. Pratt, in the practice of eye, ear, nose and throat, Minneapolis, has just returned from Vienna, where he spent the summer doing post-graduate work. Mrs. Koepcke accompanied him abroad. Dr. Koepcke has been appointed as an assistant instructor at the University of Minnesota medical school, in the department of Ophthalmology and Otolaryngology, and also on the staff of the Minneapolis General Hospital.

A regional society, to comprise the medical associations of Minnesota, Wisconsin, North and South Dakota, was organized at a meeting at The Saint Paul Hotel January 15, 1928.

Dr. W. F. Braasch, Rochester, Minn., was elected president of the new organization and Dr. George Crownhart, Milwaukee, Wis., was chosen secretary. A committee will work out details of organization.

The first meeting of the new organization will take place in Minneapolis in June, the first day of the convention of the American Medical Society. Permanent officers will be elected and organization completed.

An invitation is extended to all physicians interested in the subject of medical education to attend the Annual Congress on Medical Education, Medical Licensure and Hospitals which is to be held at the Palmer House, Chicago, Feb. 6, 7 and 8, 1928. The program is most comprehensive, some of the subjects to be discussed being: Medical research in the governmental medical departments; undergraduate instruction; autopsies; activities of state medical boards; basic science laws; annual registration of physicians.

Membership in the Medical Society of the County of Kings varies, depending on the date of graduation from medical school. The idea is not a bad one and might well be adopted by other county societies. The following schedule of membership dues is taken from the December Bulletin of the Medical Society of the County of Kings:

#### COST OF MEMBERSHIP

For New Members (never previously affiliated) the fees for the first year are twenty dollars (ten dollars to the County Society plus the State Assessment).

Subsequently, from twenty to thirty-five dollars per annum. This amount is the State Assessment of ten dollars plus the Society Fee of:

\$10	if the member graduated in 1920-1926
\$15	" " " " " 1915-1919
\$20	" " " " " 1910-1914
\$25	" " " " " 1890-1909
\$15	" " " " " 1861-1889

Arrangements are being made by the Committees on Special Study and Postgraduate Work of the Ramsey County Medical Society for a series of twelve luncheon meetings to begin in February, the speakers to be supplied by the University Extension division of the University of Minnesota medical school.

The secretaries of the component societies of the State Medical Association met in an all day session January 14 at the Saint Paul Hotel, for the discussion of the various association activities. The working of the new Basic Science law was reported by Drs. Scammon and Bell, and Dr. Comstock spoke on the new Medical Practice Act. Each county secretary was called upon to discuss the subject of the present State Association dues. In connection with the secretaries' meeting, the Council and the various new state medical committees also met for a discussion of their activities during the current year.

#### UNIVERSITY NEWS

The University of Minnesota's long-considered plan to build an auditorium as a memorial to the late President Cyrus Northrop and as a center for general student gatherings, lectures, addresses by distinguished visitors, and other large meetings, is about to be realized. Bids on the new structure probably will be asked within the next month or six weeks.

The Auditorium will be the second unit erected chiefly with money derived by gifts pledged during the Stadium-Auditorium campaign conducted in the fall of 1922. Out of funds then given the Memorial Stadium has already been built and has been in use for four seasons. It was opened in October, 1924.

Approximately \$750,000 is on hand with which to build the Auditorium, a memorial to the man who was president of the University from 1885 until 1911. Nearly \$700,000 of this has come in as payments on pledges made during the campaign, to which sum the university is adding enough from other sources to make up the total. The main structure of the Auditorium will be erected now, with several large elements in the original plans left out until additional pledges are paid up.

It will stand at the head of the University Mall, as designated in the plans for a new campus outlined some years ago by Cass Gilbert. Backing up to the Minnesota Union it will occupy the ground now devoted to the pharmaceutical gardens and will look towards Washington Avenue down the open space of lawn and trees which is flanked on either side by such buildings as the Library, Administration, Physics and the School of Chemistry. In this way it will enclose at its upper end the long quadrangle of campus which is to be the Mall.

The Field House will be ready for occupancy some time in February. Its exterior dimensions are approximately 150 by 234 ft. and its maximum interior height 100 feet from floor to roof. A quarter mile running track, a removable basketball floor, and permanent seats to accommodate 12,000 persons at basketball games are being provided. In the main area it will have ample room for a football team to practice, including punting, and for baseball to be played.

## NEW AND NON-OFFICIAL REMEDIES

**Anaerobic Antitoxin.**—An antitoxic serum prepared by immunizing animals against the anaerobic bacteria found in gangrenous wounds. Evidence has been published to indicate that the use of anaerobic toxin preparations may be of value in the treatment of gas gangrene.

**Anaerobic Antitoxin (Polyvalent)—Lederle.**—An antitoxic serum prepared by immunizing horses with gradually increasing doses of *B. tetani* and of *B. welchii* and *Vibrio septique* both obtained from anaerobic broth cultures of the organisms. Potency tests for the content of tetanus antitoxin and *B. welchii* (perfringens) antitoxin are made according to the methods prescribed by the U. S. Hygienic Laboratory; for determining the strength of the *Vibrio septique* antitoxin, serial dilutions of the antitoxin are mixed with *Vibrio septique* toxin and the mixtures injected into rabbits. The product is marketed in 100 c.c. vials, each cubic centimeter containing 50 units of tetanus antitoxin, 2 units of perfringens (*B. welchii*) antitoxin, and sufficient *Vibrio septique* antitoxin to neutralize one thousand M. L. D. of the *Vibrio septique* toxin. Lederle Antitoxin Laboratories, New York.

**Ampuls Dextrose (d-Glucose) 10 Gm., 20 c.c.**—Each ampule contains Dextrose, U. S. P., 10 Gm.; cresol, 0.1 per cent; distilled water to make 20 c.c.; buffered with dibasic sodium phosphate anhydrous and potassium biphosphate anhydrous. H. K. Mulford Co., Philadelphia.

**Ampuls Dextrose (d-Glucose) 25 Gm., 50 c.c.**—Each ampule contains Dextrose, U. S. P., 25 Gm.; cresol, 0.1 per cent; distilled water to make 50 c.c.; buffered with dibasic sodium phosphate anhydrous and potassium biphosphate anhydrous. H. K. Mulford Co., Philadelphia. (Jour. A. M. A., December 10, 1927, p. 2041.)

**Insulin-Squibb, 100 units, 10 c.c.**—Each c.c. contains 100 units of insulin-Squibb (New and Non-official Remedies, 1927, p. 197). E. R. Squibb & Sons, New York.

**Staphylococcus Mixed Bacterin.**—A staphylococcus vaccine (New and Non-official Remedies, 1927, p. 363), each c.c. containing 4,000 million killed *Staphylococcus albus* and *Staphylococcus aureus* in equal proportions. It is marketed in 5 c.c. vial packages; in single 20 c.c. vial packages; and in packages of six 1 c.c. ampules. Abbott Laboratories, North Chicago, Ill.

**Erythrol Tetranitrate Tablets—Merck, ¼ grain.**—Each tablet contains ¼ grain of erythrol tetranitrate (New and Non-official Remedies, 1927, p. 267). Merck & Co., Inc., Rahway, N. J. (Jour. A. M. A., December 24, 1927, p. 2193.)

**Typhoid Prophylactic.**—This typhoid vaccine (New and Non-official Remedies, 1927, p. 366) is also marketed in 5 c.c. vials containing 1 billion killed typhoid bacilli per c.c.; in 20 c.c. vials containing 1 billion killed typhoid bacilli per c.c. Abbott Laboratories, North Chicago, Ill. (Jour. A. M. A., December 31, 1927, p. 2263.)

## PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of Oct. 12, 1927

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 12, 1927. Dinner was served at 7 p. m. and the meeting was called to order by the President, Dr. J. E. Hynes, at 8 p. m. There were 27 members and five visitors present.

In the absence of the Secretary, Dr. McCloud read the minutes of the September meeting. Approved as read.

The President called on Dr. I. A. Abt, of Chicago, to give a talk and Dr. Abt responded in a most cordial manner.

The paper of the evening was the President's Address, which had been postponed from the September meeting. This was read by the retiring President, Dr. Frank E. Burch, and was entitled "The Early Development of Cataract Surgery" and illustrated with numerous lantern slides. Dr. Burch also showed the members of the Academy some rare old and interesting volumes on the subject.

### DISCUSSION

DR. JOHN BROWN (St. Paul): I have enjoyed very much hearing Dr. Burch on this subject. The thing that struck me, and was not emphasized particularly, is that these surgeons of that time must have gone into the eye with considerable temerity, and there must have been many eyes sacrificed. I would like to ask Dr. Burch if there is anything given in these papers that suggests the vast numbers of eyes lost by infection and if they did anything to combat it at that time. I think it must have taken a great deal of fortitude then to go after these cataracts as they did.

DR. H. W. GRANT (St. Paul): I think this subject and address has been extremely interesting. In my time I have seen nothing but the classical operation with the Von Graefe incision and I believe at the present time we have reached the limit of improvement in technic. If infection could be removed the results would be still better. Practically all eyes lost at the present time are through infection.

DR. BURCH (in closing): I have nothing to add except to answer Dr. Brown's inquiry as to whether any mention was made of the means of combating infection and preventing destruction of the eye before the day of sepsis. They were numerous, and in every textbook I was impressed with the importance or stress laid upon the season of the year, the phase of the moon, the degree of humidity, and the reliance placed in prayer, etc. There were no antiseptics used, although mention is made of many collyria, brandy and water dressings, etc., some of which had antiseptic virtue.

DR. F. L. ADAIR (Minneapolis) reported a case of "Tubal Pregnancy Accompanied by Ovarian Cyst on the Same Side":\*

\*From the Gynecological Service, Minneapolis General Hospital, Minneapolis, Minn. F. L. Adair, M.D., and R. E. McDonald, M.D.

M. R., a multipara 37 years old, was admitted to the Gynecological Service of this hospital September 14, 1927, complaining of vaginal bleeding which began two weeks before and has persisted daily up to the present time.

The patient was well developed and well nourished and showed no evidence of acute illness when admitted to the hospital. Her past history included seven normal pregnancies to term, no miscarriages or abortions, and no sickness other than the usual diseases of childhood. The menstrual life of the patient has been entirely normal since the establishment of her menses at the age of 13. From August 2nd to the 7th there was a normal period which was followed by the present vaginal bleeding which began September 1st and has continued in small amounts daily until examination, September 14th.

Upon questioning, the patient expressed the belief that she was not pregnant since she had not experienced any of the symptoms noted in her other pregnancies. At times during the last three days she had had a few colicky pains in her lower abdomen but they were never very definitely localized nor had they caused any marked discomfort or alarm.

A regular menstrual period was expected in the first week of September, but when the patient continued to flow for two weeks (longer than she ever had before) she feared that something was wrong and came into the hospital for examination and treatment.

Physical examination showed the woman to be well developed and slightly anemic but otherwise quite normal to inspection. The lungs and heart were normal though the blood pressure was elevated to a systolic pressure of 140 and a diastolic of 102. Moderate tenderness on deep palpation was noted in the left lower quadrant but no muscle spasm or rigidity was present.

A few small lesions resembling condylomata were seen on the labia but these were non-specific and the Wassermann reaction was negative. A bloody discharge of bright red color and containing shreds oozed steadily from the cervix. The cervix was of the large, bulbous type lacerated deeply on both sides and was slightly softer than normal. The corpus, however, was normal in size, position and consistency. Its mobility was noticeably restricted. In the left adnexal region a soft boggy mass, about one and one-half times the size of the corpus, could be outlined extending posteriorly into the cul-de-sac of Douglas. Examination of the left adnexa caused the patient considerable pain. The right appendages seemed entirely normal.

At this time a diagnosis of probable left tubal pregnancy, unruptured, was made with the possibility of a left salpingo-oöphoritis also considered.

Following the initial examination the patient was put to bed and treated expectantly with hot douches and fluid extract of ergot in one drachm doses every four hours. After four days in the hospital all bleeding stopped and a re-examination was made with the patient feeling much improved and having no pain. At this time the mass, which had been previously quite tender, no longer caused pain during examination. The tumor was now felt to be definitely fluctuant, about 6

to 7 cm. in diameter but not adherent to the corpus, and the diagnosis was changed. A left ovarian cyst seemed most probable and surgical treatment was advised.

An operation was performed on September 21st, after the patient had been temperature-free for seven days. At this time the hemoglobin was 68 per cent by Sahli method; erythrocyte count 3,900,000, and the leukocyte count 17,200, of which 78 per cent were p.m.n., 17 per cent lymphocytes, 2 per cent basophils, and 1 per cent mononuclears.

A midline suprapubic incision was used. As the peritoneum was exposed a slate-blue discoloration was noted and was explained by a large amount of dark red blood and clots which lay free in the lower peritoneal cavity. In exploring the pelvis the right adnexa were found normal but two distinct and closely associated masses were found in the left iliac fossa. One of these was a cystic ovary, and the other the left tube which was markedly enlarged in its isthmus, ampullar and fimbriated portions. The tube was amputated just proximal to the enlarged distal half and the ovary removed at a small pedicle arising from the utero-ovarian ligament. After removal the tube was examined and found to be unruptured. Bleeding had occurred through the fimbriated end.

The two masses, which were about equal in size and shape, lay close together and are compared in the accompanying illustration. From this comparison and the fact that the tumor masses lay in such close apposition, it may be seen that the case presented some difficulties in making an accurate diagnosis (Fig. 1).

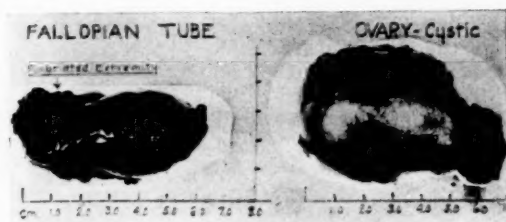


Fig. 1.

Recovery was prompt and uneventful.

The pathologist submitted the following gross and microscopic reports: "The ovary has undergone extensive cystic degeneration and the normal tissue of the tube is largely replaced by soft hemorrhagic tissue resembling placenta. Microscopic examination of the tube shows chorionic villi and decidua."

DR. E. M. HAMMES (St. Paul) reported the following case:

A man, age 68, was seen in consultation with Dr. L. E. Penny, October 6, 1927. His family and personal histories were negative.

On September 16, 1927, the patient suddenly became quite weak, so that he had to remain in bed. He was seen by Dr. Penny, who found nothing abnormal except a tachycardia, rate 120 to 140. The general weak-

ness continued and Dr. Hall was called in consultation. All findings were negative at this time except for the persistent tachycardia and a marked general weakness. His heart sounds were normal. There was no change noted in his condition until October 5th. On that date the patient walked from his bed to the bathroom, and when he attempted to get up he found that he was unable to walk. He finally got back to bed with the help of his wife. Doctor Penny was called. The patient was very restless, tossing in bed. He complained of severe pain in his left leg. Both extremities were paralyzed. He was given a hypodermic of strychnia in the right leg and its function gradually returned. The left leg remained paralyzed, was cold, and cyanotic.

When I saw him that evening he seemed somewhat flighty, had definite hallucinations of sight—saw small bugs crawling up and down the wall, but knew that this could not be true because his wife was such an excellent housekeeper. He knew he was in his own home, but thought that the whole building had been moved to Stillwater.

The neurological examination was negative except for the findings in the lower extremities. The right leg was normal except for an increased knee jerk and a positive Babinski; pulsation in the right leg could be felt in the femoral and dorsal pedis arteries. The left leg was completely paralyzed. There was no pulsation in any artery, including the femoral; the leg was cold, the toes were dry and gangrenous, a line of demarcation was noted below the knee, the knee and Achilles jerks were absent, there was no Babinski, and no plantar reflex. There was complete loss of all forms of sensation from the knee down. His pulse was 126, temperature normal, blood pressure systolic 140, diastolic 75. Blood Wassermann negative.

The patient gradually became more delirious, and Dr. Colvin was called in consultation with the idea of amputating the leg. Dr. Colvin advised against this. The patient died October 11, 1927.

This patient evidently developed a transient thrombosis or embolus of the abdominal aorta, sufficiently high up to interfere with the circulation of the spinal cord, producing an ischemia with a subsequent paralysis. The thrombus finally lodged in the left common iliac artery, with the resultant gangrene of the left leg. This would explain the early transient involvement of the right leg with increased knee jerk and Babinski, and the terminal changes in the left leg.

No postmortem was obtained.

#### DISCUSSION

DR. GILFILLAN: Was there pain when he first had the paralysis?

DR. HAMMES: He had excruciating pain below the left knee. At no time did he have any temperature. There was no evidence of endocarditis, according to Dr. Hall and Dr. Penny.

DR. GILFILLAN: A reasonable explanation of the case would be a development of an auricular flutter with formation of a thrombus in the left auricle and from this an embolus, lodging at the bifurcation of the aorta, later moving into the left common iliac artery.

However, this will not explain the positive Babinski and increased knee jerk in the right leg.

The meeting adjourned.

CARL B. DRAKE, M.D.  
Secretary.

## PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

## MEDICINE

### SUPERVISORS:

F. J. HIRSCHBOECK,  
205 W. 2nd STREET, DULUTH  
THOMAS A. PEPPARD,  
LA SALLE BLDG., MINNEAPOLIS

FORMS OF PLEURO-PULMONARY TUBERCULOSIS SEEN AMONG THE ARABS (IN NORTHERN AFRICA): Ryckebush George (Review de la tuberculose, 1927—3rd Series, VIII, 481). This report is based on the author's personal experience in four years service as military surgeon in the French Army. During this time he had occasion to examine numerous tuberculous Arabs, both soldiers and civilians. Many of the cases seen by him clinically, afterward came to autopsy.

Tuberculosis is common among Arabs who live in towns or cities or who have been in contact with Europeans. For instance, 94 per cent of the adults at Arzeu in Algeria reacted to the skin tuberculin test. In a rural community of Arab shepherds, not in contact with Europeans, 108 tests were made and only four positive reactions were obtained. Three of these were in one family in which there had been two deaths from tuberculosis. In the cities and villages the types of tuberculosis found are not very different from those seen in Europe. In the rural regions, cutaneous, glandular and osteoarthritic forms are more common and when the lungs are affected the clinical picture has certain special features. This is an important matter to the French military authorities as five times as many of their Arab soldiers are from the country as from the cities.

The types of tuberculosis met among the rural Arabs in Northern Africa are grouped in the following classes.



1. Trachea-bronchial adenitis.
2. Tuberculous bronchitis.
3. Pleural symphysis.
4. Tuberculous broncho-pneumonia.
5. Massive caseous pneumonia.
6. Miliary tuberculosis.
7. Disseminated tuberculosis.

The tracheo-bronchial adenitis is associated with more or less extensive mediastinal lesions. The clinical signs of these hilus lesions upon which the writer places reliance and which he has seen confirmed by autopsy are paravertebral dullness, a blowing type of respiration with whispered pectoriloquy, D'Espines sign, Wirrlez voice, loud transmission of transthoracic bruits, transmission of the heart sounds, etc. These glandular masses often become very large and become associated with parenchymal lesions. Generally an active associated primary focus is demonstrable. These large glandular masses are indicative of a primary infection more or less recent and not of a re-infection.

A simple tuberculous bronchitis is a less virulent form of tuberculosis seen in those patients that have acquired some resistance by former infection or a tendency to fibrosis sometimes dependent on preceding syphilis. This type was especially common among old soldiers who in spite of coughing and spitting were able to do their work for long periods and were in that way a fruitful source of infection to other soldiers.

The pleural infections resulting in obliteration of the pleural cavity and various types of thickened pleural walls were often merely preliminary to serious lung lesions. Fluid formation was rare. Various forms of broncho-pneumonia, acute caseous pneumonia and miliary tuberculosis were frequently encountered. The author of the paper concludes that while some of the cases seen were evidently examples of primary infection, more were due to transitional lesions somewhat affected by previous infection. The Arabs seem to be midway between the blacks and the whites as regards immunity development.

A. T. LAIRD, M.D.

**THE PROGNOSIS AND TREATMENT OF THE RHEUMATIC INFECTION:** Thos. T. Mackie (*The Amer. Heart Jour.*, October, 1927). The author's contribution has been recognized recently by an editorial in the *London Lancet*, indicating the value and widespread interest in his theory of the nature of the disease.

Mackie believes that rheumatism is a chronic and often a progressive disease characterized by alternating periods of activity and quiescence. There are certain points of similarity between rheumatic infection and syphilis of the vascular system, as was already pointed out by Garrod in 1890 and more recently by Swift.

As etiologic factors in the production of rheumatic heart disease chorea and tonsillitis must be viewed as precipitating diseases, as well as rheumatic fever.

The age of onset of rheumatism is sometimes difficult to estimate, but in early to middle childhood it is not so often polyarticular in character, as it is more com-

monly accompanied by alleged "growing pains," myositis, and other fugitive metastatic areas of involvement. In the adolescent group the migrating polyarthritides becomes the dominant phase. Chorea, on the other hand, occurs more commonly between the ages of 5 and 10 years. Acute rheumatic fever likewise differs from chorea in that the primary cardiac insult is more likely to occur with the initial attack of rheumatism, whereas the evidence of cardiac disease in chorea usually develops after successive attacks.

It appears that all things considered the removal of foci of infection is associated with a drop in the incidence rate of recurrence; yet the latter is by no means uncommon.

When rheumatic patients are studied for a long period of time, the chronicity of the disease becomes strikingly apparent, many of them having recurrences of acute rheumatism after years of apparent health and freedom from symptoms. One of the strongest arguments for the chronicity of the disease is the Aschoff body. The progressive nature of the cardiac damage, the tendency to anemia and the recurrence of fugitive somatic symptoms likewise suggest the insidious and relentless nature of the process.

F. J. HIRSCHBOECK, M.D.

**ANGINA PECTORIS IN YOUNG PEOPLE:** White and Mudd (*The Amer. Heart Jour.*, October, 1927). White and Mudd report eight cases of angina pectoris occurring in young people less than 30 years of age—an incidence not common but noteworthy because of its existence. Every case exhibited rheumatic aortic regurgitation, but evidence of aortic stenosis, mitral stenosis, acute infection or congestive failure was not constant. The association of angina pectoris and luetic aortitis, with or without aortic regurgitation, is well known. It may be that the responsibility for the attacks of angina in rheumatic heart, with aortic regurgitation, lies in the decrease in coronary circulation associated with a low diastolic pressure, or by involvement with a rheumatic aortitis or coronary arteritis. The attacks frequently came on without exertion, which seemed to play a lesser role in its production than in angina pectoris in advanced years. The authors believe that rheumatic infection of the arterial wall may possibly be a more important factor than the type of valvular disease, since it has been found in mitral stenosis, apparently without aortic valve disease in conjunction. The possibility must be kept in mind that with or without rheumatic or luetic infection, coronary thrombosis and sclerosis may occur in individuals under 30 years of age.

Postmortem examination should be carefully carried out in patients in the presclerotic group, as it may reveal material of interest in explaining and solving the difficult problem of the mechanism of angina pectoris.

Interestingly, the prognosis in young people with angina pectoris appears to be fairly good, the duration of life after the onset of the symptom of pain being

considerably greater than the average of large groups of all ages.

The article includes an extensive bibliography on the subject.

F. J. HIRSCHBOECK, M.D.

**SUBACUTE BACTERIAL ENDOCARDITIS WITH UNUSUAL VESICULOBULLOUS SKIN LESIONS: NECROPSY REPORTS IN TWO CASES:** Davis and Ayman (*The Amer. Heart Jour.*, August, 1927). The authors describe two unusual cases of subacute bacterial endocarditis which came under their observation. The remarkable feature of the disease was the presence of vesiculobullous lesions primarily involving the face, neck and scalp, and later by a secondary outbreak mainly confined to the extensor surfaces of the upper extremities. At necropsy typical vegetations were found on both mitral and aortic valves, and the streptococcus viridans was isolated from the vegetations of one case.

The Kahn and Wassermann tests were positive in both cases reported, but no evidence of syphilis was found on clinical or postmortem examination. The positive serology, they believe, should be considered as an incidental and secondary phenomenon of a disturbed colloid or lipid balance in the serum, as pointed out by Landau and Held.

The authors state that neither patient gave a history of rheumatic fever and postmortem revealed no evidence of old mitral disease, but the typical vegetation of subacute bacterial endocarditis was found on the mitral and aortic valves in both.

This report is of interest chiefly because it may indicate a trend toward the belief that subacute bacterial infection with streptococcus viridans may often be a pre-agonal infection, since it has been encountered in other debilitating conditions, and has been found before by Libman in acute disseminated lupus erythematosus. If this is true, the infection with the streptococcus viridans is incidental and not the primary condition. The two cases reported suggest the likelihood of the skin condition being primarily a pemphigus vulgaris.

F. J. HIRSCHBOECK, M.D.

#### OXYGEN BY INJECTION

Experiments to determine the value of administering oxygen intravenously, intraperitoneally and subcutaneously on dogs are reported. Theoretically the oxygen tension of arterial blood can be raised by intravenous injection of oxygen. Practically, however, the oxygen deficiency is accentuated when this point is reached. Results from subcutaneous injection were even less encouraging. There was, however, sufficient absorption from intraperitoneal injection of oxygen to justify clinical experiment with the method. It would be necessary to control the procedure by arterial puncture and blood-gas analysis. (*Jour. A. M. A.*, December 17, 1927, p. 2120.)

#### SURGERY

##### SUPERVISORS:

DONALD K. BACON,  
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,  
MAYO CLINIC, ROCHESTER

**INCONTINENCE OF URINE OF RENAL ORIGIN:** R. Campbell Begg (*Brit. Jour. of Surg.*, Vol. XV, pp. 229-243). An excellent discussion of incontinence of urine of renal origin, together with a report of one case, successfully treated by nephrectomy, is given. Technically the expression, incontinence of urine, is generally restricted to pathological leakage from the bladder.

The case reported by the author was one in a girl, aged 6, who had a supernumerary right ureter emptying into the urethra, outside the bladder neck. A partial nephrectomy was first attempted but this proved unsuccessful, due to interference in the blood supply of the lower pole, so that total nephrectomy had to be performed.

The etiology of the condition is based on one component of a double ureter, or more rarely a single ureter emptying abnormally into the urethra or vestibule of the vagina. Embryologically this is explained by the fact that the Wolffian ducts enter into the formation of the vestibule and the urethra in the female. In cases of double ureter there are two renal buds arising from the same Wolffian duct. Ordinarily these buds lie close together, and the resulting ureteric orifices lie adjacent in the bladder. Exceptionally one bud develops much higher than the other and forms the upper pole of a double kidney. The ureter of the lower pole may empty into the bladder normally and the other ureter enters much later. Therefore its orifice is lower and may be in the urethra, vestibule, or Gaertner's duct.

Developmentally and practically it has been borne out that a ureter opening extravasically belongs to the upper pole of a double kidney, save those rare cases where a single ureter may open extravasically. Two cases of complete absence of the bladder are reported, in one of which the ureters entered the urethra and in the other the vestibule. This is explained by lack of expansion of the Wolffian ducts and their early fusion and descent, so that in one case they formed only the urethra and vestibule and in the other the vestibule alone.

The condition is commonly disregarded as a cause of incontinence and for that reason the actual number of cases reported is not a true index as to its frequency. The condition occurs exclusively in the female. Corresponding anomalies in the male—the ureter opening into the prostatic urethra, the vas deferens or seminal vesicles are not accompanied by any incontinence because the powerful external sphincter prevents it.

Pathologically only eight single ureters have been reported emptying extravasically; 42 cases were proved to be double. The right kidney is most frequently associated with the anomaly and the vestibule is the most common site of termination, and those cases in which the ureter was reported as emptying into the vagina were all in adult women, in whom the hymen was not intact. The ureter is practically always dilated and the ureteral orifice often exceedingly hard to find. Infection is usually present in the affected kidney or half kidney; the younger the patient the less chance of infection. Diminished functional activity is also often present.

Symptomatically diurnal and nocturnal incontinence with regular normal micturition is characteristic. Diurnal incontinence is worse. The diagnosis is based on the history and cystoscopic findings. Plain x-ray plates will often hint as to the involved kidney. The kidney which is the largest and whose notch is not in the center is most likely affected.

Prognosis is good with early surgical treatment. Conservative surgical measures are rarely indicated and often lead to secondary operation and occasionally fatal results. In the majority nephrectomy or partial nephrectomy is the procedure of choice. In clean cases ligation of the ureter may suffice. If the kidney is performing a large share of renal function the ureter may be implanted into the bladder.

D. P. GREENLEE, M.D.

**THE ASSOCIATION OF CHRONIC BRIGHT'S DISEASE WITH OBSTRUCTION IN THE LOWER URINARY TRACT:** A. Ralph Thompson (Guy's Hospital Reports, Vol. LXXVII, No. 384, p. 464). This is a very short paper stating the following question: "Is it not possible that some cases of chronic interstitial nephritis are really associated with stricture of the urethra or some other form of chronic urinary obstruction?" The author answers the question by giving about fifty résumés of postmortem findings in cases of chronic nephritis in which there was some lower urinary tract obstruction associated. He states that we are often accustomed to hear of diminished renal efficiency without at all grasping what is the condition of the kidneys that may have given rise to the diminished functioning power. We are so accustomed to see cases of urinary failure associated with acute sepsis in the kidneys that many of us fail to realize that there is, in many cases, simple chronic interstitial nephritis which may be unequally distributed between the two kidneys. If we get rid of the irritative cause, such as enlarged prostate or stricture of the urethra, we do much to improve the condition.

The author states further that sufficient cases are noted to allow him to think that some forms of chronic Bright's disease may in fact be due to causes acting from below, thus bringing the chronic condition into line with the acute condition known as ascending nephritis of a septic nature.

P. G. FLOTHOW, M.D.

**THE FORMATION OF A NEW VAGINA BY A NEW PLASTIC TECHNIC:** Robert T. Frank and S. H. Geist (Amer. Jour. Obstet. and Gyn., 1927, Vol. XIV, 712-718). The two best accepted technics for the formation of a vagina in malformed individuals are the Baldwin method which utilized a double barrel segment of the small intestine (mortality 20.75 per cent) and the Popow-Schubert method in which the lower rectum is transplanted into the vulva, the upper rectal segment utilized for reestablishing continuity of the intestinal canal. Other less dangerous methods such as homoplastic transplantation of vaginal mucosa from other patients, Thiersch skin grafts, peritoneal transplants, et cetera, have given almost uniformly unsatisfactory results.

It seems unjustified to undertake such an operation when it involves grave risks. Occasionally in individuals, either married or with strong sex feeling, it seems justified to attempt to establish a vagina.

The authors describe a method by which a skin-tube is formed along the thigh and left attached at either end. After two weeks the distal end may be partially incised. The third step consists in establishing a canal in the recto-urethral vesicle septum; complete the cutting across of the distal end of the flap and splitting it; turning the pedicle through an arc of 180 degrees, folding it over an appropriate hollow vaginal plug with its raw surfaces outward; introducing the speculum and flap into the gap between the rectum and vagina; and uniting the free end of the anterior portion of the flap, whenever possible, with vulvar skin.

The speculum is removed in eight days and the proximal end of the flap is completely severed and the edge of the new vaginal tissue united to the vulvar edge.

The authors report one patient on whom this operation was performed with a good result after seven months. They recommend the method for further trial. It is devoid of danger and permits the using of healthy, well-nourished, fully mobilized skin flaps, devoid of hair.

HAROLD E. SIMON, M.D.

**RUPTURED URETHRA: A NEW METHOD OF TREATMENT:** Henry Banks (Brit. Jour. of Surg., Vol. XV, No. 58, pp. 262-263). This report is based on a study of three cases, upon which the writer operated successfully.

The method is described as follows: the bladder is opened suprapubically and a fully curved metal prostatic catheter is passed through the internal meatus along the urethra to the point of rupture and a second catheter of a similar type is passed through the external meatus along the urethra until it makes contact with the first one, end to end. The first catheter is then gently withdrawn and the second catheter pushed further in at the same time, being careful to keep the beaks in contact all the while. No force was used and in this manner it was possible to introduce the urethral metal catheter into the bladder. A self retaining rubber catheter is then attached to the end of the metal

catheter, which protrudes suprapubically. The metal catheter is then withdrawn through the external meatus and the rubber catheter is fixed in place. The bladder is closed and a small drain placed in the space of Retzius. Bladder lavage with boric solution is instituted the third day and about the tenth day the urethral catheter is removed.

The three cases operated where all similar in type, being crushing injuries to the pelvis, with rupture of the membranous urethra. All were operated within three hours of the time of injury and there was no urinary extravasation due to the fact that the patients had not attempted to void and that they were warned against voiding when first seen. All the cases did well and were all right three years after operation.

Regarding diagnosis the author states that failure to pass a catheter into the bladder is sufficient indication for surgery. He advises using a soft rubber catheter first and then a medium sized metal one. Bleeding from the external urethral meatus and perineal swelling were constant signs.

The method offers the following advantages over opening the perineum: (1) The operation can be performed rapidly; this is of importance, as most of these cases have multiple injuries and suffer from severe shock; (2) there is less formation of scar tissue at the site of rupture, and (3) drainage of the space of Retzius is provided for and sepsis does not occur.

D. P. GREENLEE, M.D.

**INDICATIONS FOR SURGICAL TREATMENT OF DUODENAL ULCER:** Lester D. Powell (Jour. of Iowa State Med Soc., 1927, Vol. XVII, pp. 348-352). Duodenal ulcer as a clinical entity has been recognized since 1817, although the surgical treatment was not instituted until many years later. Prior to 1881 the field of gastric surgery was practically unknown. Billroth and Wolfier performed the first successful pylorotomy and in 1881 Wolfier and Nicolandini performed the first gastro-enterostomy for pyloric obstruction, due to a non-resectable carcinoma. In 1886 Heineke and Mikulicz introduced pyloroplasty for the relief of benign pyloric obstruction.

With the increased frequency of operation for duodenal ulcer more came to be known about the pathology of such lesions. Surgeons learned that all patients could not expect to be cured by surgery and that some patients with apparently quite active symptoms would obtain relief from medical care.

The mere presence of a duodenal ulcer is not an indication for surgery. An uncomplicated duodenal ulcer with a short history in most instances improves rapidly with medical management. Surgery is contraindicated in neurotic, asthenic mentally or constitutionally inferior individuals in whom the symptoms are not marked, and in young individuals with a short history until medical treatment has failed.

The patients in whom surgery is always definitely indicated are those with symptoms complicated by hemorrhage, perforation, or obstruction. Hemorrhage rarely has to be treated as an emergency operation.

Cases with repeated hemorrhages should be transfused and operated immediately. Because of the fact that ulcers bleeding before surgical intervention have a tendency to bleed after operation, it is best to attack the ulcer directly by excision or cauterization. Perforation is the most formidable complication and requires early surgical intervention. A careful closure should be made of the perforation and a posterior gastro-enterostomy established immediately, if possible, or at a later date.

Chronic obstruction from any cause requires surgical treatment. The more marked the obstruction, the more satisfactory are the results obtained from operation. These patients carry an increased surgical risk because of dehydration and lack of resistance, often associated with changes in blood chemistry typical of an alkalosis. The preoperative treatment consists of bed rest, frequent gastric lavage, forced fluids subcutaneously, rectally and intravenously.

Any one operation may be ideal for selected cases and unsatisfactory in others. In cases with acute inflammation, chronic indurated ulcers or ulcers with obstruction, gastro-enterostomy is the procedure of choice. Small superficial duodenal ulcers without obstruction, located on the anterior surface and near the pylorus, have been satisfactorily treated by simple excision of the ulcer and a portion of the pyloric sphincter. It appears to the conservative person that resection of the stomach is an extremely radical procedure in the treatment of duodenal ulcer.

Preoperative and postoperative medical management, including dietary measures and the eradication of all foci, helps to obtain satisfactory surgical results.

HAROLD E. SIMON, M.D.

**THE ORIGIN OF RICE BODIES IN BURSAL SACS:** E. B. Mumford (Jour. Bone and Joint Surgery, 1927, 9, 381-386). Foreign bodies have been frequently found in synovial cavities. When these bodies have been numerous and lying free in the fluid they have been termed "rice bodies." In the bursal sacs they may be found when the chronic bursitis with its excessive bursal fluid has been caused by a low grade pyogenic infection, by trauma, or, more frequently, by tuberculosis. In all instances their formation is dependent upon the presence of some small nucleus about and upon which may be deposited fibrin derived from the bursal fluid.

The physical character of the rice body varies. The nucleus is frequently an isolated bit of fibrin. The author concludes, from a study of the bursal sac in cases of tuberculosis, that giant cells, which are pushed from the lower strata of the sac wall, losing their nuclei, are later liberated and form the nucleus for a rice body. Fibrin from the fluid is then deposited upon this giant-cell nucleus. Through constant rubbing against each other, these bodies become round or oval and may have facets or depressions upon their highly polished surfaces.

HAROLD E. SIMON, M.D.



**THE RESULTS OF OPERATION FOR DUODENAL ULCER IN PHYSICIANS:** D. C. Balfour (Ann. of Surg., Vol. LXXXVI, No. 5, p. 691). Balfour reviews the results of surgery for duodenal ulcer in one hundred physicians. This was done because it was felt that the operations were only done where clearly indicated as physicians and only after all medical means have been exhausted. Furthermore, since physicians have difficulty in carrying out a regular postoperative régime it was thought that results should be more than a fair test of the value of surgery.

Operations performed were posterior gastro-enterostomy, 89 per cent; excision alone, 6 per cent; anterior gastro-enterostomy, 3 per cent; and gastro-duodenostomy 2 per cent. The average age was 47; average duration of symptoms was 13 years and the average time since operation was 8½ years.

The results in posterior gastro-enterostomy were excellent. Complete relief of symptoms in 87 per cent and partial relief in 6 per cent. In five cases the result was complete failure; one of these developed a marginal ulcer which was operated upon and another has symptoms suggestive of marginal ulcer which are being controlled by diet. All of the three cases in which anterior gastro-enterostomy was done obtained complete relief, in two of them entero-anastomosis was also added. Taking these groups together, gastro-enterostomy was found completely successful in 90 per cent, partially successful in 5 per cent and failure in 5 per cent, although in three of the five cases of failure, symptoms were apparently due to some other condition, rather than the ulcer.

In the cases where excision only was done, 33 per cent or two cases obtained complete relief. One case required further operation, one case was a complete failure, and two cases gave symptoms suggestive of gall-bladder disease.

In the two cases where gastroduodenostomy was done, one case obtained relief, the other required a second operation.

Taking the one hundred cases as a whole, 84 cases obtained complete relief, 6 incomplete, but considered the operation worthwhile, so that 90 per cent may be classed as successful. Five cases required second operation—two for hemorrhage, one for reactivation of ulcer and 2 for gastrojejunal ulcer; three of these five have complete relief since second operation and in two it is too early to tell. In five cases the result was complete failure, one of which is an inoperable carcinoma of the stomach, one marginal ulcer and three cases where no relief was obtained. The results of conservative operation followed by second operation where needed are satisfactory in 93 per cent. The source of this information seems to indicate that conservative surgery is the sound attitude to take in duodenal ulcer cases.

P. G. FLOTHOW, M.D.

## PEDIATRICS

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**EFFECT OF THERAPEUTIC DOSES OF ULTRAVIOLET RADIATION ON BASAL METABOLISM IN CHILDREN:** Margaret E. Fries, M.D. (Amer. Jour. of Diseases of Children, August, 1927). It has been assumed that there is a rise in basal metabolism following ultraviolet irradiations. The increase in blood calcium and in phosphorus is well known. The general improvement in the patient's condition, such as increase in appetite, gain in weight and improved sleep, has been observed.

Three children in the hospital and two in the outpatient department were treated with ultraviolet radiations three times a week.

Determinations of basal metabolism were made from twenty to seventy hours following treatment.

The basal metabolic determinations did not vary more than 10 per cent, except in the second series of treatments in an ambulatory case. As not all conditions could be controlled in the ambulatory cases, the decline that occurred in this case cannot be attributed solely to the ultraviolet radiations.

Ultraviolet radiations did not cause any change in basal metabolism, except in one child. It seems justifiable to assume that a series of treatments with ultraviolet radiations will not affect the basal metabolism of the majority of children.

R. N. ANDREWS, M.D.

**PREMATURE INFANTS:** Julius H. Hess, M.D., and I. McKy Chamberlain, M.D. (Amer. Jour. of Diseases of Children, October, 1927). In the first class may be included various injuries, falls, heavy lifting, overwork, or other physical exhaustion and sudden emotional disturbances. The conditions that fall within the second category all react to a greater or lesser degree on the fetus, some producing only momentary weakness, as the milder acute infections, and others causing a weakened physical condition as a result of their long-continued action on the nutrition and development of the fetus.

The higher mortality of the group of infants born at home indicates the importance of early care and especially of maintenance of a nearly normal body temperature. Transportation was undoubtedly a large factor.

The great majority of the infants are fed with a medicine dropper until they are strong enough to take

food from a bottle. Catheter feeding is instituted when indicated, when the infant is unable to swallow properly or when feeding by the dropper precipitates attacks of cyanosis. Therefore, a regular feeding regimen must be started early. Human milk is essential to a low mortality. Practically all infants at first receive eight feedings daily.

Further fluids, preferably inert, such as water or 1 per cent lactose solution, are administered to compensate for the loss of body fluids through the kidneys, bowels, lungs and skin. The infant requires about one-sixth of its body weight of water, inclusive of that contained in the milk, in twenty-four hours while in the heated bed. By the fourth day approximately one-seventh of the body weight of fluids and human milk of a food value of 70 calories per kilogram every twenty-four hours are required to maintain life.

To fulfill all their needs, infants will therefore require from 140 to 200 c.c. of breast milk per kilogram, or about one-seventh to one-fifth of their body weight daily.

#### ARTIFICIAL FEEDINGS

No comparison can be made of the results to be expected from human milk and those to be obtained with artificial food, such as limited chymogen milk, skimmed and whole cultured lactic milks and boiled skim and whole sweet milks. Orange juice, 8 drops daily and increased; cod liver oil, 8 drops daily and increased. More recently the author has added raw egg yolk to the breast milk or artificial feeding to meet the iron requirements of these infants. Exposure to the quartz light is given daily, as early as the third week, the time of exposure being dependent on the individual infant.

R. N. ANDREWS, M.D.

**THE EARLY OCCURRENCE OF GASTRIC HEMORRHAGE IN CHILDREN WITH SPLENOMEALY:** Richard M. Smith, M.D., and Philip J. Howard, M.D. (*Amer. Jour. of Diseases of Children*, October, 1927). The primary diseases of the blood, notably purpura and hemophilia, and occasionally scurvy and malaria, are accompanied by gastric bleeding. Gastric ulcer in children is rare, but does occur. Severe bleeding from varicose veins of the stomach or esophagus is not uncommon in Banti's disease, splenic anemia or thrombophlebitis of the portal and splenic vein.

Symptoms common to all: A child previously well suddenly vomits a large amount of bright and clotted blood. Physical examination reveals no evidence of disease except a secondary anemia. Examination made somewhat later shows marked enlargement of the spleen.

The explanation for this symptom-complex is not entirely clear, but it seems to us that probably it depends on some condition that causes obstruction to the splenic vein. That thrombosis of the portal vein may occur secondary to infection in some other part of the body and that an enlargement of the spleen and gastric

hemorrhage may result from this condition are well recognized. The decrease in the size of the spleen after hemorrhage and its subsequent increase in size were striking in the author's two recent cases and are recorded in connection with many of the case reports collected by Wallgren.

Immediately following a hemorrhage, transfusion is indicated. The etiology of this condition is best explained on the basis of obstruction to the splenic vein, which produces chronic passive congestion of the spleen and distention of the gastric and esophageal veins, and in the veins in the adhesions between the spleen and the stomach or diaphragm. Thrombophlebitis of the splenic vein is an important cause of venous obstruction. Splenectomy offers a means of controlling the hemorrhage and, so far as the author's observation goes, of effecting a cure of the disease.

R. N. ANDREWS, M.D.

#### PULMONARY TUBERCULOSIS IN INFANTS—

**Bacteriologic Diagnosis by Examination of the Stomach Contents:** P. F. Armand-Delille, M.D. (*Amer. Jour. of Diseases of Children*, October, 1927). Many pediatricians and phthisiologists regard the diagnosis of pulmonary tuberculosis in infancy and in childhood as impossible or at least difficult.

About thirty years ago, Dr. H. Meunier of Pau, France, showed that it is possible to obtain the sputum of an infant if one lavages the stomach early in the morning, just after the first cough and before the first meal. The author's technic is as follows: About 80 c.c. of tepid water is introduced into the stomach and withdrawn by siphoning.

If characteristic sputum is obtained, direct microscopic examination by the Ziehl-Neelsen method is all that is necessary, but in most cases homogenization is required. The liquid is centrifugized in four tubes and the precipitates united in a porcelain dish to which is added 30 c.c. of water and 10 drops of normal sodium hydroxide; the whole is heated for ten minutes, 50 c.c. of water being added slowly. If the specific gravity is over 1.004, a little alcohol is added. The material is again placed in four tubes, and centrifugized for forty-five minutes, and the precipitate is stained by the Ziehl-Neelsen method.

The results obtained by this method have been interesting. In sixty-two cases in which only the direct examination without homogenization was used, tubercle bacilli were found in only 10 per cent, while in 110 cases in which the method here detailed was employed, 31 per cent were positive.

R. N. ANDREWS, M.D.

**THE PREVENTION AND CONTROL OF RESPIRATORY DISEASES IN THE YOUNG:** Jacob Sobel, M.D. (*Arch. of Ped.*, December, 1927). Diseases which involve the respiratory apparatus comprise about

40 per cent of all cases. One-fifth of all deaths under one year of age and some one-fourth to one-third of all deaths in children under five years of age are chargeable to the diseases of the respiratory tract.

The prevention and control of respiratory diseases are bound up with every member of the household. A person with an acute or subacute coryza is only too often publicly at large and each in his own way acts as a disseminator of infection. Over and above all, the importance of taking to bed immediately upon the onset of any acute condition of the respiratory tract no matter how minor or trivial and remaining there until well.

A cold in the nose in infancy and early childhood is dangerous because of the greater tendency of the process to extend downward to the lower respiratory passages.

It therefore appears from a scientific as well as from a practical standpoint, that chilling of the body surfaces, whether because of increased local congestion or of ischemia, is a predisposing factor to the development of respiratory involvement, in that it produces conditions favorable for bacterial attack.

The mortality of bronchopneumonia is 40 per cent. The cost of ignoring the common cold is too high.

All diseases which are nutritional or metabolic in their origin carry with them a reduced vitality or resistance and thereby an increased susceptibility to respiratory infection.

A goodly number of post-operative pneumonias are preventable. Chilling of the body and anesthesia are a vicious combination. Prevention is more a matter of education than of medication, compulsion and legislation, for it is hard to legislate righteousness, common sense or the golden rule into most people.

R. N. ANDREWS, M.D.

**THE VALUE OF EARLY DIAGNOSIS AND TREATMENT IN ENLARGEMENT OF THE THYMUS GLAND:** Robert P. Sturr, M.D. (Arch. of Ped., December, 1927). The thymus is closely related to various disturbances of nutrition and metabolism and especially those concerning the ossification of the bony structure. The author feels that rickets and thymic changes are very closely allied, and more frequently than is realized the two are present.

Two essential types of symptoms are noted: (a) the respiratory type due to direct pressure on the adjacent structures, especially the trachea. (b) The toxic type or circulatory type, given general symptoms and physical findings, and not in the vicinity of the thymus itself.

The persistent formation of mucus in the pharynx and trachea is a constant pressure symptom. A hoarse spasmodic cough frequent both day and night, in severe cases. At times breathing seems to be an effort, with stridor during inspiration which is deep and labored. Holding the breath is a very common and early symptom. This type of thymus is dangerous to life and prompt and efficient action must be taken in its diagnosis and treatment.

Attacks of choking were noticed in 10 per cent of the cases studied. General or toxic symptoms—under this

heading came about 40 per cent of the cases studied. The child shows every evidence of a marked and intense toxicity.

The normal thymus will extend about  $\frac{1}{2}$  cm. beyond the lateral margins of the spine on each side. Anything beyond this was considered to be pathological and enlarged.

X-ray therapy is by all means the method of choice in enlargement of the thymus. Regeneration of the thymus gland is frequent and the patient should have a re-examination at varied intervals.

R. N. ANDREWS, M.D.

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## EYE, EAR, NOSE AND THROAT

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**ACUTE OTITIS IN INFANTS:** L. W. Dean (Arch. of Otolaryngology, September, 1927). It is a common observation in both the Pediatric and the Otolaryngologic services of the State University of Iowa that acute otitis in infants may cause refusal of food. In the absence of other symptoms or of otologic indications, refusal of food is, in many cases, sufficient reason for performing myringotomy. Middle-ear infection is frequently an etiological factor in malnutrition and loss of weight, in cholera infantum, mastoiditis and syncopal attacks.

Dean says: "The majority of infants with acute otitis whom I see have marked otologic symptoms. The drum head usually presents a change in color; the short process is apparently shorter than usual; the light reflex is distorted, and there is a slight bulging of the posterior superior quadrant or of the posterior wall of the canal. I always perform a myringotomy and wait for a report from the pediatrician before performing a mastoidectomy, unless the pediatrician says the case is so critical that the best drainage of all infected cavities must be secured immediately. If I perform a myringotomy, and at the end of forty-eight hours the infants is no better, the decision as to whether or not drainage of the mastoid should be performed is decided by the otologist and pediatrician in conference."

Dean concludes: "(1) The symptoms which lead to the discovery of otitis in infants are much more frequently pediatric than otologic; (2) the otologist and the pediatrician should work in the closest coöperation and have complete confidence in each other; (3) if otitis is present, it can always be diagnosed; (4) paranasal sinus disease usually coexists with acute otitis; it is as a rule advisable to treat the patient for both. It is often difficult to decide which is the more influential in causing the systemic disturbance."

F. W. BRIGGS, M.D.

## BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

## BOOKS RECEIVED FOR REVIEW

**THE PREVENTION OF PREVENTABLE ORTHOPEDIC DEFECTS, WITH SPECIAL REFERENCE TO THE SPINE AND THE FEET.** S. C. Woldenberg, B.Sc., M.D., M.Sc., Attending Orthopedist, Post Graduate Hospital and Michael Reese Dispensary, Chicago. 120 pages. Illus. Cloth, \$2.00. Saint Paul: Bruce Publishing Company, 1927.

**THE EXTRA-OCULAR MUSCLES.** Luther C. Peter, A.M., M.D., Sc.D., Prof. of Diseases of the Eye, Postgraduate School of the University of Pennsylvania, etc. 294 pages. Illus. Cloth, \$4.00. Philadelphia: Lea & Febiger, 1927.

**X-RAYS AND RADIUM.** George M. MacKee, M.D., Prof. and Director of Department of Dermatology and Syphilology, New York Post Graduate Medical School and Hospital. 788 pages. Illus. 2nd edition, revised. Cloth, \$10.00. Philadelphia: Lea & Febiger, 1927.

**POLIOMYELITIS.** W. Russell MacAusland, M.D., Surgeon-in-Chief, Orthopedic Department, Carney Hospital, Boston. 402 pages. Illus. Cloth, \$5.50. Philadelphia: Lea & Febiger, 1927.

**THE CURRENT SIGNIFICANCE OF THE WORD "ALUM."** William D. Richardson. 93 pages. Cloth, \$1.00. Chicago: The Commonwealth Press, Inc., 1927.

**INTERNATIONAL CLINICS.** Vol. IV. 37th Series. Henry W. Cattell, M.D., Editor. 309 pages. Illus. Philadelphia and London: J. B. Lippincott Co., 1927.

**THE SHIP SAILS ON.** Nordahl Grieg. Translated from the Norwegian by A. G. Carter. 219 pages. \$2.50. New York: Alfred Knopf, 1927.

This is a story of the sea, told in a most realistic manner, with no sentiment nor romance, but with a clarity and sincerity that has a definite appeal. It is not a pleasant story, at times it is definitely sordid, but it contains truth, a certain philosophy and a portrayal of the peril of venereal disease. With the crew, we live the life at sea, isolated from the world, and the life there we find to be one of minor incidents, of love and of hate, of tragedy and comedy just as we find life anywhere. Woven with the thread of the story is the shadow of venereal disease which touches the lives of the men, one by one, and entirely changes them.

Benjamin, seaman ordinary, nineteen years old, in the struggle between "life's happiness and life's adventure" decides to go to sea, to see what it is like before he settles down to business. To his young, enthusi-

astic, romantic eyes, life on shipboard in the southern seas is one of glorious adventure and he loves his shipmates and the ship herself with a great love. At the same time he acquires the philosophy of the sea and accepts it. "A man's life drifts away like a puff of breath. . . . A life or two, a sorrow, an accident, all is left behind, all is forgotten. The ship sails on. . . . Each of us stands at his wheel toiling and sweating and keeping it going, the noise of it roars over the earth until we are tired to death; then we drop and fresh hands clutch greedily at the wheels and drive them on like madmen, on and on forever, but why? And they would all answer triumphantly as one man: 'We're keeping the machinery going.'"

After thirty days at sea they land at Cape Town, and, bitterly disappointed at no letter from his sweetheart, Benjamin goes ashore with his mates for a night of debauch, and returns the next morning, cynical, disillusioned, hating himself, with his youth left behind him. The next day brings the long expected letter, but his joy and plans for a better life are overturned when he finds that he has contracted a venereal disease, presumably syphilis. He determines to kill himself, and taking the ship's little dog, who is also ill, he prepares to jump into the sea. But his courage fails him and he returns to his mates with hatred in his heart toward them, toward himself and toward the ship which he had loved.

MARGARET WARWICK, M.D.

**INTERNATIONAL CLINICS,** Volume 4, 1926, Volumes 1 and 2, 1927. Henry W. Cattell, M.D., Editor. Philadelphia and London: J. B. Lippincott Co., 1926, 1927.

These volumes are intensely interesting, well written, well illustrated and must be read to be appreciated. The subjects are practical but heterogeneous and of so great a variety that individual mention of them can not be made. They are recommended as an excellent review of recent progress in various phases of medicine and should be so regarded, rather than as a reference work.

OLOF I. SOHLBERG, M.D.

**MINERAL WATERS OF THE UNITED STATES AND AMERICAN SPAS.** William Edward Fitch, M.D., Member of the International Society of Medical Hydrology; The American Medical Association; The Medical Association of the Greater City of New York, Etc; Late Major Medical Corps of the U. S. Army; Formerly Lecturer on Surgery, Fordham University School of Medicine; Assistant Gynecologist O. P. D. Presbyterian Hospital; Attending Physician, Vanderbilt Clinic, College Physicians and Surgeons, N. Y. City. Illustrated. Philadelphia and New York: Lea & Febiger, 1927.

This monograph deals with hydrotherapy and all its phases, and gives a somewhat detailed discussion of many diseases which the author feels are best treated by hydrotherapeutic means. There is an excellent discussion of radio-active waters. The author feels that



absent treatment with bottled radio-active waters is much inferior to the use of fresh water. Inasmuch as we know that the active life of radium emanation covers only a period of about three days, it is obvious that water shipped any distance cannot be radio-active.

There is an excellent chapter on external hydrotherapy which every one should read—in particular, the discussions of whirlpool bath, the wet-sheet pack, the external douches, and Nauheim bath.

The major portion of the book is devoted to a detailed discussion of American Spas, the chemical and physical characteristics of the water and the accommodations for guests. The author feels that many American Spas are at least equal to those of Europe and suggests a study on the part of physicians of these American Spas instead of reference of the patient to those of Europe.

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**POSITION WANTED**—As assistant in doctor's office or clinic in Minnesota or surrounding territory. Registered nurse with postgraduate training in pediatrics, physiotherapy and orthopedic surgery. Address C-164, care MINNESOTA MEDICINE.

**LOWRY BUILDING**—Want physician to share nicely furnished, well lighted and arranged office. Reception and examining rooms. \$25.00. Address C-163, care MINNESOTA MEDICINE.

**POSITION WANTED**—In small hospital or doctor's office in Minneapolis or Saint Paul as office assistant. Nurse's training and practical experience in hospital. Address C-162, care MINNESOTA MEDICINE.

## MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

PHYSICIANS LICENSED AT THE OCTOBER, 1927, EXAMINATION  
TO PRACTICE IN MINNESOTA

## BY EXAMINATION

NAME	MEDICAL COLLEGE	ADDRESS
Allan, Frank Nathaniel.....	U. of Toronto, M.B. 1922.....	Rochester, Minnesota.
Brabec, Paul Frank.....	Iowa State U., M.D. 1926.....	Perham, Minnesota.
Danzer, Jos. Theo.....	St. Louis U. Sch. of Med., M.D. 1927.....	Shriners' Hospital, Minneapolis.
Foster, Wilmot Coyne.....	U. of Oregon, M.D. 1920.....	Rochester, Minnesota.
Groves, Morton Wm.....	Ind. U. Sch. of Med., M.D. 1926.....	2832 Blvd. Place, Indianapolis, Indiana.
Hanson, Everett Carlyle.....	U. of Minn., M.B. 1927.....	Ancker Hospital, St. Paul, Minnesota.
Holland, Wilbur Wallis.....	U. of Pa., M.D. 1925.....	Rochester, Minnesota.
Jennings, Frank LaMont.....	Syracuse U., M.D. 1913.....	Oak Terrace, Minnesota.
Lindstrom, Everett H.....	U. of Minn., M.B. 1927.....	Swedish Hospital, Minneapolis.
Macnie, John Percival.....	Harvard, M.D. 1925.....	2424 Lake Place, Minneapolis.
Mayo, Chas. Wm.....	U. of Pa., M.D. 1926.....	Rochester, Minnesota.
McLeod, James Lawrence.....	U. of Manitoba, M.D. 1926.....	Bovey, Minnesota.
Norment, Wm. Blount.....	Jefferson, M.D. 1922.....	Rochester, Minnesota.
Partch, Wallace Taylor.....	Rush, M.D. 1926.....	Rochester, Minnesota.
Prout, Curtis Tuttle.....	Cornell, M.D. 1924.....	Rochester, Minnesota.
Rempel, Dietrich D.....	Imperial U., Jurjew, 1918.....	Butterfield, Minnesota.
Rohwer, Roland Theodore.....	Creighton, M.D. 1924.....	Rochester, Minnesota.

## BY RECIPROCITY

Bunten, Wm Andrew.....	U. of Nebraska, M.D. 1922.....	Rochester, Minnesota.
Dawley, Walter A.....	U. of Ill., M.D. 1926.....	Rochester, Minnesota.
Evans, Edward Thompson.....	Harvard, M.D. 1922.....	2423 Irving Ave. S., Minneapolis.
Heimdal, Clarence Oliver.....	Rush, M.D. 1926.....	Rochester, Minnesota.
Parson, Geo. Washington.....	Med. Col. of Va., M.D. 1922.....	Rochester, Minnesota.
Ruby, Fred McKemy.....	U. of Mich., M.D. 1905.....	Hibbing, Minnesota.
Scholl, Marguerite Julia.....	{U. of So. Cal., M.D. 1921} {U. of Minn., M.D. 1927 }	Rochester, Minnesota.
Troup, Ralph Leslie.....	U. of Nebr., M.D. 1921.....	Rochester, Minnesota.

## RECIPROCITY NATIONAL BOARD

Fowler, Louis McCargo.....	U. of Pa., M.D. 1924.....	Rochester, Minnesota.
Mahorner, Howard Raymond.....	U. of Pa., M.D. 1925.....	Rochester, Minnesota.
Priestley, Joseph Biddle.....	U. of Pa., M.D. 1925.....	Rochester, Minnesota.
Sussex, Lloyd Thomas.....	Northwestern, M.D. 1926.....	Rochester, Minnesota.